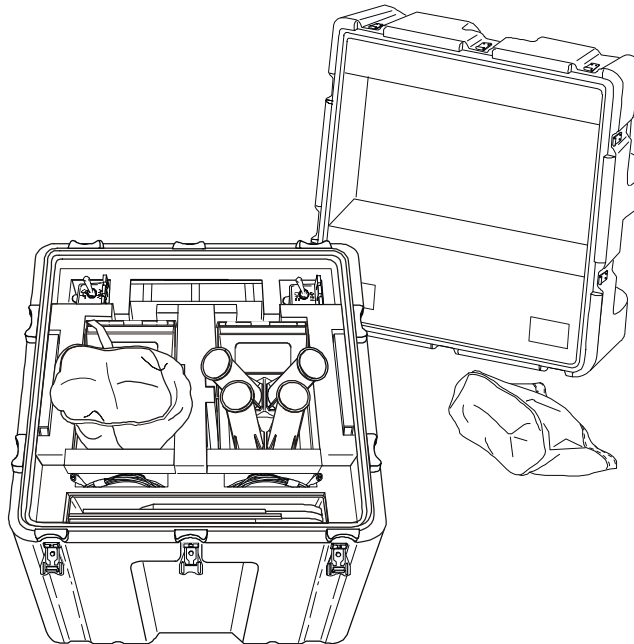


ARMY TM 3-1055-649-12&P
MARINE CORPS TM 104000-12&P

TECHNICAL MANUAL

**OPERATOR'S AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)**

**INSTALLATION KIT, GRENADE LAUNCHER:
ADJUSTABLE, MULTI-PURPOSE, 66MM, TURRET
MOUNTED, M315
(NSN 1055-01-483-8479)**



WARNING - This document contains export-controlled technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec 2751 et seq) or Executive Order 12470. Violation of these export laws is subject to severe criminal penalties.

DISTRIBUTION STATEMENT C - Distribution authorized to U.S. Government Agencies and their contractors. This publication is required for administrative and operational purposes as determined 28 March 2000. Other requests for this document shall be referred to Commander, SBCCOM, ATTN AMSSB-PM-RSM-R, 5183 Blackhawk Rd, Aberdeen Proving Ground, MD 21010-5424.

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HEADQUARTERS, DEPARTMENTS OF THE ARMY AND MARINE CORPS

**31 AUGUST 2001
PCN 345 104000 00**

WARNING SUMMARY

The M315 Installation Kit weighs 175 lb. To avoid possible back injury, use four people to lift.

Grenades could accidentally fire. To avoid possible death or injury, do not place any part of your body in front of a loaded discharger. If misfired grenades launch during unloading, personnel in the area could be killed or injured. Keep vehicle pointed down range until grenades are removed.

Grenades can kill or injure personnel or damage equipment. Handle grenades with care as follows:

- Do not drop or throw grenades.
- Do not use damaged grenades.
- Keep grenades away from electric sparks.
- Keep containers sealed until you are ready to use grenades.
- When operating the discharger at any elevation, be careful not to aim the discharger at other vehicle mounted equipment.

Read and understand the SAFETY, CARE, AND HANDLING paragraph in WP 0001 00 of this TM before operating this equipment.

Read and understand the specific ammunition information contained in WP 0013 00.

To avoid possible injury from fired grenades, wear protective eyewear and roll down shirtsleeves if standing in turret area.

DO NOT use any grenade if damage is noted to the grenade end cap or grenade body. Such a grenade must be set aside for disposal.

DO NOT fire an M90, L96A1, or L97A1 grenade from the 50M or 75M settings on the adjustable aiming bracket.

For information on first aid, see FM 21-11.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

Dates of issue for original manual is:

Original .. 0 .. 31 August 2001

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 6 AND TOTAL
NUMBER OF WORK PACKAGES IS 35 CONSISTING OF THE FOLLOWING:

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WP 0011 00 (4 pgs)0		WP 0028 00 (4 pgs).....0			

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HEADQUARTERS
DEPARTMENTS OF THE ARMY AND MARINE CORPS
Washington, D.C., 31 August 2001

TECHNICAL MANUAL

OPERATOR'S AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

INSTALLATION KIT, GRENADE LAUNCHER: ADJUSTABLE, MULTI-PURPOSE,
66MM, TURRET MOUNTED, M315
(NSN 1055-01-483-8479)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your recommended changes as follows:

ARMY – Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) located in the back of this book to Commander SBCCOM, ATTN AMSSB-REN-CW, 5183 Blackhawk Rd, Aberdeen Proving Ground, MD 21010-5424.

MARINE CORPS – Submit NAVMC 10772 to Life Cycle Management Center, Code 852-1, 814 Radford Blvd, Suite 20320, Albany, GA 31704-1128.

A reply will be furnished directly to you.

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OPERATOR AND UNIT MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
GENERAL INFORMATION

SCOPE

Type of Manual

Operator's and Unit maintenance manual including a Repair Parts and Special Tools List (RPSTL).

Equipment Name and Model Number

This manual covers the Installation Kit, Grenade Launcher: Adjustable, Multi-Purpose, 66mm, Turret Mounted, M315.

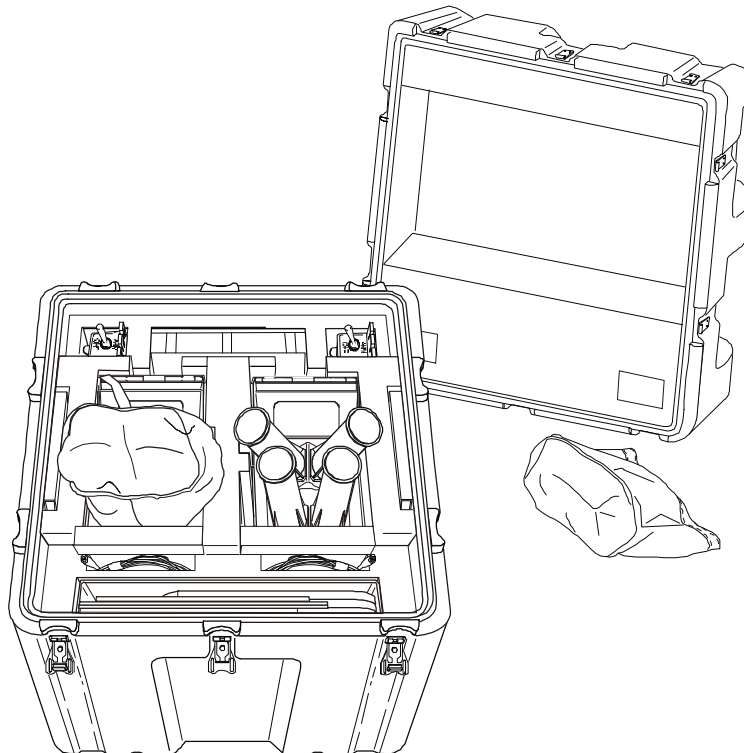
The kit includes the Discharger, Grenade, Smoke, Countermeasure: Lightweight, M7.

The common names for these two items are "installation kit" and "discharger." The common names will be used in the rest of this TM.

Purpose of Equipment

Depending on the type of grenade loaded into the discharger, this equipment allows the user to produce protective smoke clouds or to fire non-lethal riot control grenades.

The installation kit can be installed on a machine gun equipped vehicle or TOW II missile equipped vehicle.



MAINTENANCE FORMS, RECORDS, AND REPORTS

(ARMY) Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS).

(MARINE CORPS) Refer to the on-line Marine Corps Publications Distribution System (MCPDS) or Marine Corps Stock List SL-1-2 Index of Technical Publications. Use TM 4700-15, Equipment Record Procedures.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your installation kit equipment needs improvement, let us know. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance.

(ARMY) Submit an SF 368 (Product Quality Deficiency Report). Mail it to the address specified in DA PAM 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS). We will send you a reply.

(MARINE CORPS) Submit an SF 368 in accordance with MCO 4855.10 directly to:

Life Cycle Management Center
Code 822-2
814 Radford Blvd, STE 20320
Albany, GA 31704-0320

CORROSION PREVENTION AND CONTROL

Corrosion Prevention and Control (CPC) of materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

(ARMY) If a corrosion problem is identified, it can be reported on an SF 368 as described in the EIR paragraph. Use of key words such as "corrosion", "rust", "deterioration", or "cracking" will ensure that information is identified as a CPC problem.

(MARINE CORPS) Report corrosion problems using SF 368, Product Quality Deficiency Report, in accordance with MCO 4855.10.

DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE

(ARMY) When the components of the installation kit are installed on the vehicle, destroying the vehicle will effectively destroy the kit components. Refer to TM 750-244-6, Procedures for Destruction of Army Tank-Automotive Equipment to Prevent Enemy Use.

(MARINE CORPS) Destroy by weapons, fire, smashing, disassembly, burning, or any other means to render the equipment useless to the enemy.

PREPARATION FOR STORAGE OR SHIPMENT

Instructions for preparing the installation kit for storage or shipment are contained in Work Package 0020 00.

SAFETY, CARE, AND HANDLING

General Information

Use extreme caution when firing the discharger from the vehicle. Be sure to read and understand the warnings at the front of this manual. Refer to AR 385-64 and DA Pam 385-64 for information about general ammunition care, handling, and safety.

Do not stand in front of a loaded discharger for any reason. The discharger ejects the grenades with extreme force. Being hit by an ejected canister could cause injury or death.

Do not fire an M90, L96A1, or L97A1 grenade from the 50M or 75M settings on the adjustable aiming bracket. The 50M and 75M settings are for M98 and M99 grenades.

Read and understand the specific ammunition warnings and information contained in WP 0013 00.

Hangfires, Misfires, and Duds

A hangfire grenade is a temporary failure or delay in the action of the propellant charge. When a hangfire occurs wait 10 seconds and make two additional attempts to fire within a 10-second interval. Wait five minutes. If grenade still does not fire, treat it as a misfire.

A misfire is:

The failure of the L96A1 or L97A1 grenade to eject from the discharger.

The failure of the M90, M98, and M99 grenade payload canisters to eject from the grenade tube.

When a misfire occurs, perform the following:

WARNING

Grenades could accidentally fire. To avoid possible death or injury, do not place any part of your body in front of a loaded discharger. If misfired grenade launches during unloading, personnel in the area could be killed or injured. Keep vehicle pointed down range until grenades are removed.

1. Ensure the ARM/OFF switch is set to ARM and press FIRE button.
2. If grenade does not fire, place ARM/OFF switch to OFF; check that grenade is firmly seated in discharger tube.
3. Place ARM/OFF switch to ARM and press FIRE button.
4. If grenade does not fire, try to fire grenade from another discharger tube. When moving grenade make sure to hold grenade away from body and pointed down range. If grenade fires, notify Unit maintenance that discharger tube is defective.
5. If grenade still does not fire remove misfired grenade from the discharger and place it 200 meters (220 yards) away from personnel and equipment. Notify EOD personnel and give type, quantity, and precise location of the grenade.

A dud is:

An M90, M98, or M99 grenade that has fired its payload from a grenade tube but one or more of the canisters have failed to burn or explode. After waiting 15 minutes, discard in accordance with Unit SOP.

An L96A1 or L97A1 grenade that failed to disperse its payload once it has launched from the discharger tube.

In a training situation, wait 15 minutes and then notify EOD personnel; give the type, quantity, and precise location of the dud.

SUPPORTING INFORMATION FOR REPAIR PARTS, SPECIAL TOOLS, AND TMDE AND SUPPORT EQUIPMENT**Common Tools and Equipment**

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit. For tools used to maintain the installation kit components, refer to table 2 in WP 0022 00.

Special Tools, TMDE, and Support Equipment

Refer to table 2 in WP 0022 00 for TMDE. No special tools or support equipment is required.

Repair Parts and Materials

Repair parts to maintain the installation kit are listed and illustrated in WP 0024 00 through WP 0030. Expendable supplies and materials are listed in WP 0034 00.

CHAPTER INDEX OF WORK PACKAGES

CHAPTER 1

DESCRIPTION AND THEORY OF OPERATION

This chapter contains the following Work Packages:

Equipment Description and Data	0002 00
Theory of Operation	0003 00

OPERATOR AND UNIT MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
EQUIPMENT DESCRIPTION AND DATA

GENERAL

This Work Package contains the following paragraphs:

- Equipment Characteristics, Capabilities, And Features
- Location and Description Of Major Components (Stored In Reusable Container)
- Location and Description Of Major Components (Assembly Parts Package)
- Location and Description Of Major Components (Installed On Vehicle)
- Equipment Data

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

Can be installed on a variety of light vehicles including:

M1025, M1026, or M966 for Army.

M1043, M1044, M1045, and M1046 for Marine Corps.

The installation kit comes with an adjustable aiming bracket, already assembled to the M7 discharger, that allows the operator to fire some grenades at different ranges.

WARNING

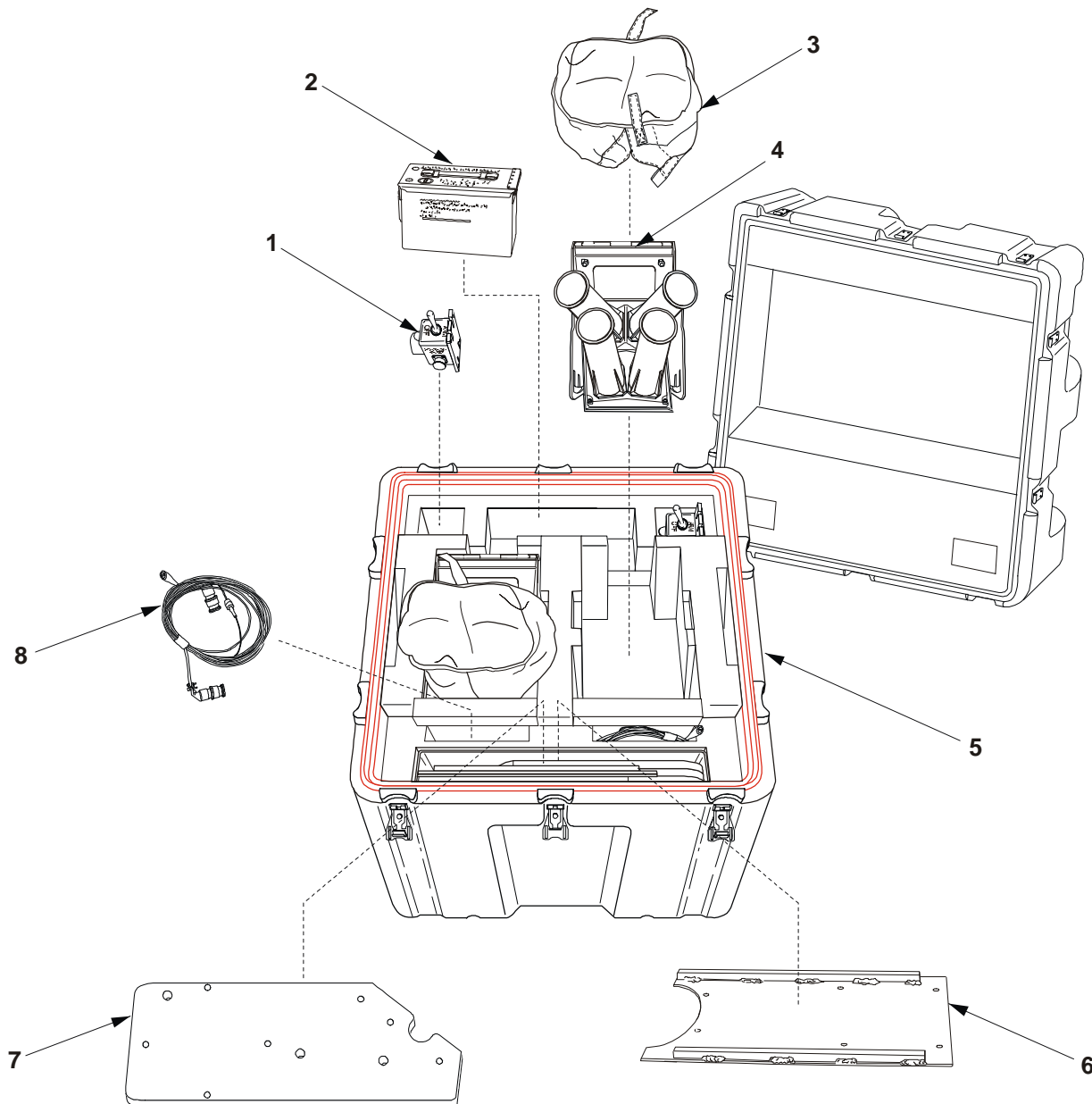
Do not fire an M90, L96A1, or L97A1 grenade from the 50M or 75M settings on the adjustable aiming bracket. The 50M and 75M settings are only to be used for the M98 or M99 grenades.

Can be installed on the vehicle by operator using on-board tools provided in the kit.

Can be operated on the move or while stationary.

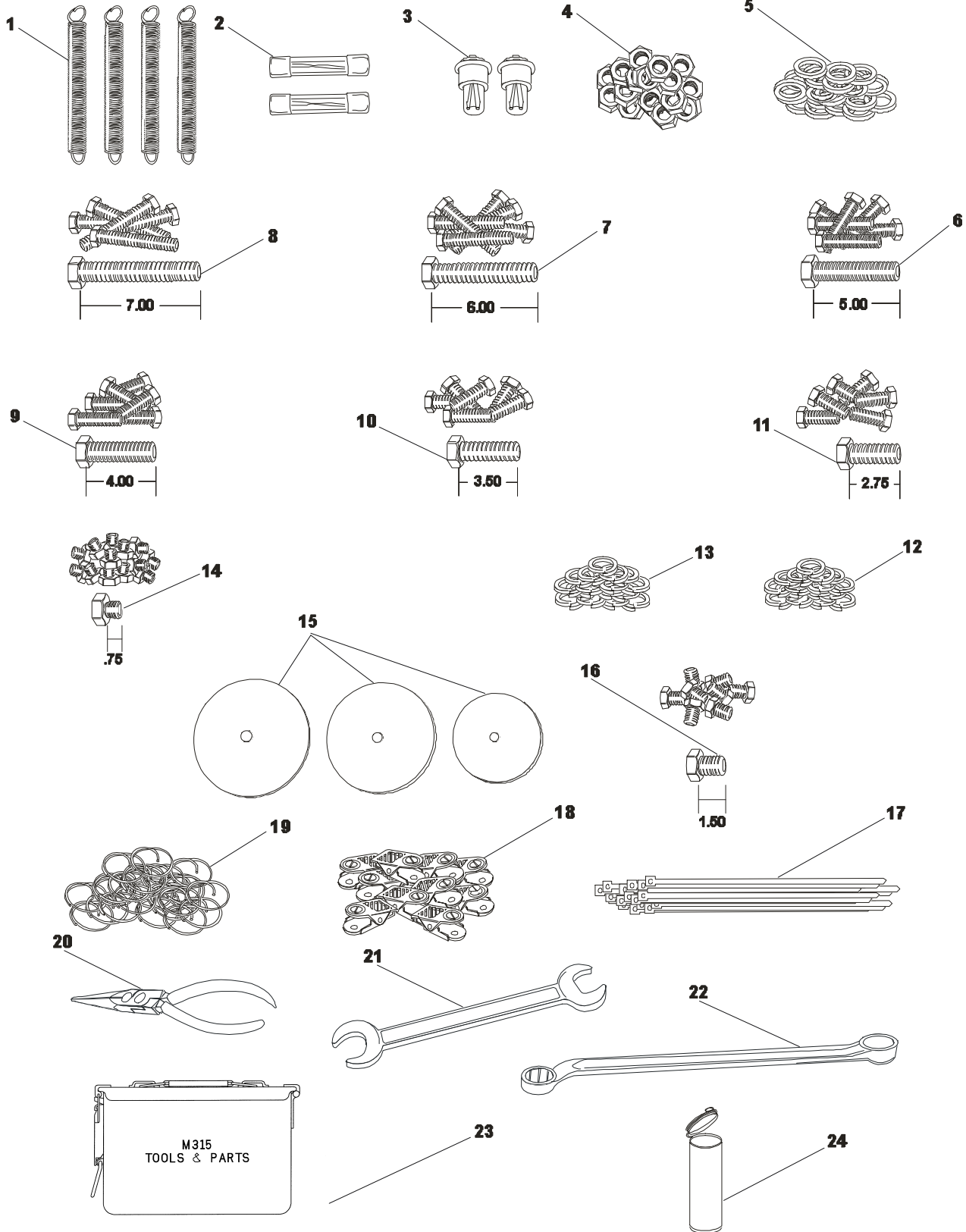
Easily maintained at the Unit level. Requires no special tools or handling.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (STORED IN REUSABLE CONTAINER)



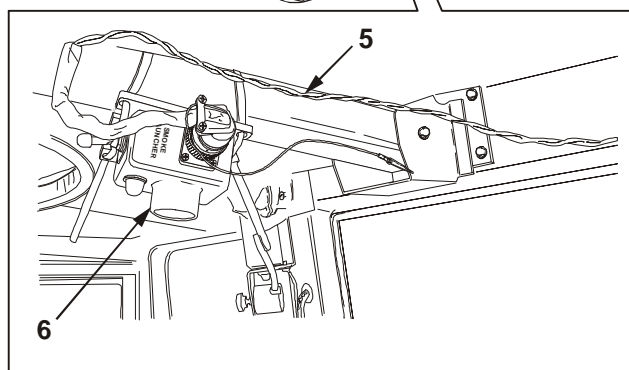
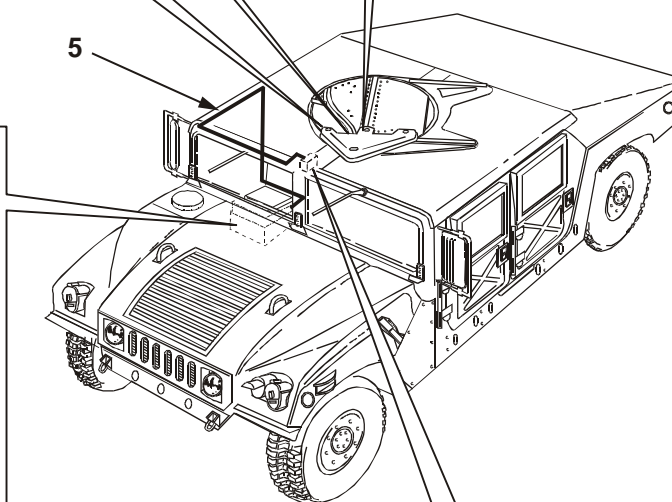
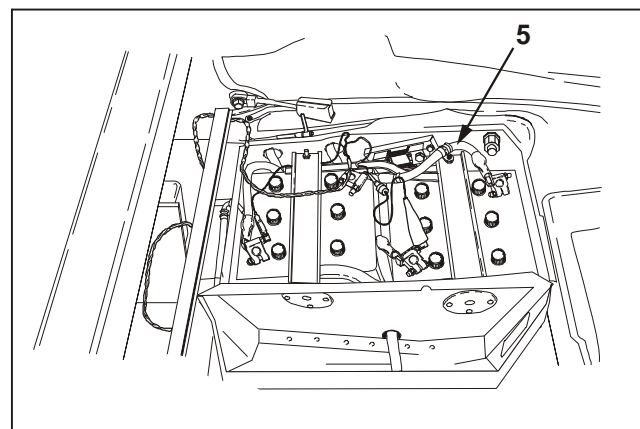
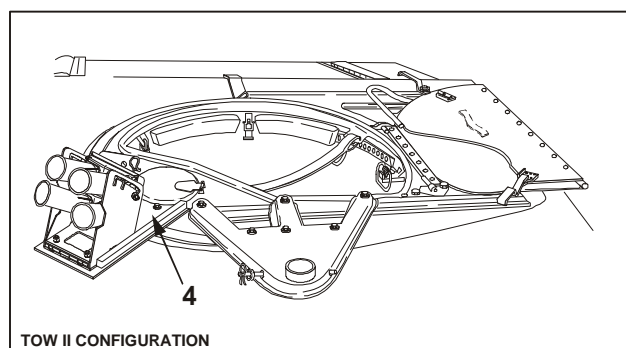
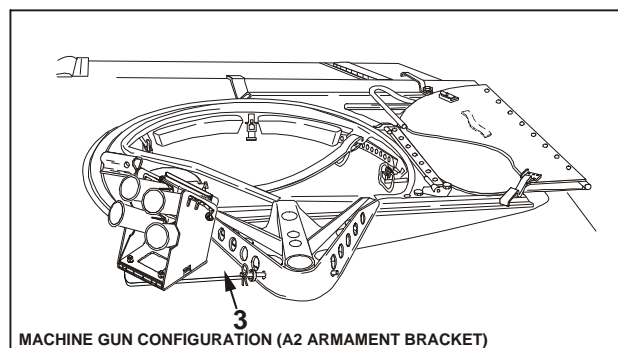
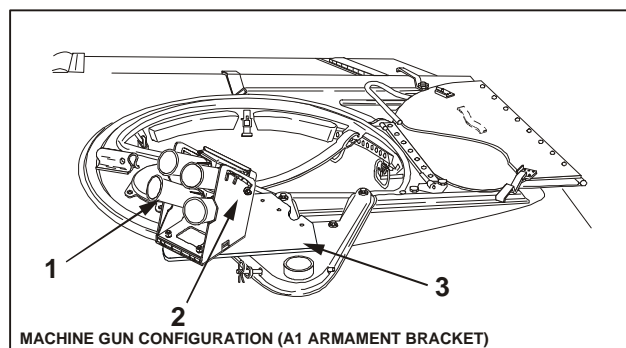
KEY	EQUIPMENT	DESCRIPTION
1	Arming Firing Unit	Mounts on the inside of the vehicle. Electrical receptacle connector connects to the vehicle batteries. The ARM/OFF switch arms the fire button. The indicator light goes on when the fire button is armed. Pressing the fire button fires the grenade.
2	Assembly Parts Package	Contains the tools and hardware required to install the components on the vehicle. It also contains spare lamps for the arming firing unit and spare fuses for the wiring harness. See next page for a more detailed explanation of the contents of this package.
3	Discharger Cover	Covers discharger tubes when not in use. When installed, protects inside of discharger from debris.
4	Discharger Assembly	<p>Consists of an M7 discharger, elevation bracket, and adjustable aiming bracket already pre-assembled.</p> <p>Mounts on turret of vehicle. Four plastic discharger tubes are angled to launch grenades in an arc.</p> <p>An electrical receptacle connector on the cover plate connects discharger to vehicle batteries and arming firing unit using the wiring harness.</p>
5	Reusable Storage Container	Used to store and protect the kit components between missions.
6	Turret Mounting Bracket (TOW II)	Secures discharger to the vehicle turret when the vehicle is configured for a TOW II missile.
7	Turret Mounting Bracket (Machine Gun Configuration)	Secures discharger to the vehicle turret when various machine guns are installed. The multiple pre-drilled holes allow installation with vehicles that have either an A1 or A2 armament bracket.
8	Wiring Harness	Provides electrical power from vehicle's batteries to discharger and arming firing unit.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (ASSEMBLY PARTS PACKAGE)



KEY	EQUIPMENT	DESCRIPTION
1	Springs	Spare springs for the adjustable aiming bracket.
2 and 24	Fuse, 20 amp	Spare fuses for the wiring harness. The fuses and lamps are shipped in a plastic vial (24) to protect them from breakage.
3 and 24	Lamp	Spare lamps for the arming firing unit. The fuses and lamps are shipped in a plastic vial (24) to protect them from breakage.
4	Locking Nut, 3/8 in.	Used with all the 3/8 in. bolts listed below.
5	Flat Washer, 3/8 in.	Used with all the 3/8 in. bolts listed below.
6	Bolts, 3/8 in. x 5.00 in.	Secure the machine gun bracket to the vehicle's A1 armament bracket.
7	Bolts, 3/8 in. x 6.00 in.	Same as item 6. Provided as an option due to the differences in some vehicles.
8	Bolts, 3/8 in. x 7.00 in.	Same as item 6. Provided as an option due to the differences in some vehicles.
9	Bolts, 3/8 in. x 4.00 in.	Used with the 3/8 in flat washer and 3/8 in. lock nut to secure the TOW II mounting bracket to the turret pedestal.
10	Bolts, 3/8 in. x 3.50 in.	Same as item 9. Provided as an option due the differences in some vehicles.
11	Bolts, 3/8 in. x 2.75 in.	Same as item 9. Provided as an option due the differences in some vehicles.
12	Lock Washers 3/8 in.	Used with items 16 and 17 below to help secure the machine gun bracket.
13	Lock Washers 5/16 in.	Used with the 5/16 in. bolts and 5/16 in. flat washers to secure the discharger assembly to either the TOW II bracket or Machine Gun bracket.
14	Bolts, 5/16 in. x .75 in.	See item 13.
15	Retaining Disk Set	Set of three circular plates used with the bolts to help secure the machine gun turret bracket to the A2 armament bracket of the vehicle.
16	Bolts, 3/8 in. x 1.5 in.	Secures the machine gun turret bracket to the A2 armament bracket of the vehicle. Used with the retaining disks described above.
17	Tiedown Straps	Used to mount the arming firing unit inside the vehicle.
18	Metal Clips	Used to secure the wiring harness to various locations inside the vehicle.
19	Circle Cotters	Prevents the handle from sliding out of the discharger assembly.
20	Needle Nose Pliers with Side Cutter	Used to cut the tie down straps during assembly and disassembly of the arming firing unit.
21	Open End Wrench	Used with the box head wrench to help tighten and loosen mounting hardware during assembly and disassembly.
22	Box Head Wrench	Used to tighten or loosen various mounting hardware during assembly and disassembly.
23	Container	Resusable container used to store all the supplies and tools.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (INSTALLED ON VEHICLE)



KEY	EQUIPMENT	DESCRIPTION
1	Discharger	Mounts on turret of vehicle. Four plastic discharger tubes are angled to launch grenades in an arc. An electrical receptacle connector on the cover plate connects discharger to vehicle batteries and arming firing unit using the wiring harness.
2	Elevation Bracket Assembly	Allows the operator to choose one of three different settings to deliver the grenades. This affects the range the grenade can travel.
3	Turret Mounting Bracket (Machine Gun Configuration)	Secures discharger to the vehicle turret when various machine guns are installed. The multiple pre-drilled holes allow installation with vehicles that have either an A1 or A2 armament bracket.
4	Turret Mounting Bracket (TOW II Configuration)	Secures discharger to the vehicle turret when vehicle is configured for a TOW II missile.
5	Wiring Harness	Provides electrical power from vehicle's batteries to discharger and arming firing unit.
6	Arming Firing Unit	Mounts on inside of vehicle. Electrical receptacle connector connects to vehicle batteries. The ARM/OFF switch arms the fire button. The indicator light goes on when fire switch is armed. Pressing the fire button fires the grenade.

EQUIPMENT DATA

INSTALLATION KIT (FULLY STOCKED)

Weight.....	175 lb
Width	27 in.
Height.....	20.25 in.
Length	29 in.

GRENADE RANGES

WARNING

Do not fire an M90, L96A1, or L97A1 grenade from the 50M or 75M settings on the adjustable aiming bracket. The 50M and 75M settings are only to be used for the M98 or M99 grenades.

NOTE

The following grenade ranges are approximate. Environmental conditions, such as wind speed and direction, can affect these ranges substantially.

M90 (100M setting).....	30 – 40 m
L96A1/L97A1 (100M setting).....	65 – 95 m
M98/99 (100M setting)	100 m
M98/99 (75M setting).....	75 m
M98/99 (50M setting).....	50 m

OPERATOR AND UNIT MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
THEORY OF OPERATION

ELECTRICAL CONNECTIONS

The installed equipment uses the vehicle's battery for power. A wiring harness connects the discharger and the arming firing unit to the batteries located under the passenger seat.

LOADING DISCHARGERS

Grenades are muzzle-loaded into discharger tubes.

ARMING

Moving the ARM/OFF switch on the arming firing unit from OFF to ARM closes electrical circuit. Arming firing unit indicator light goes on to warn that discharger is armed for firing.

FIRING

Pressing the fire button on arming firing unit sends electrical charge to the discharger. A resistor in the discharger controls and directs flow of electricity. The charge flows through electrical contacts in each discharger tube to an electrical firing spring clip in grenade base.

CHAPTER INDEX OF WORK PACKAGES

CHAPTER 2

OPERATOR INSTRUCTIONS

This chapter contains the following Work Packages:

Description and Use of Controls and Indicators	0004 00
Operation Under Usual Conditions	
Assembly and Preparation for Use	0005 00
Operation	0006 00
Disassembly After Use.....	0007 00
Operation Under Unusual Conditions	0008 00

OPERATOR AND UNIT MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
DESCRIPTION AND USE OF CONTROLS AND INDICATORS

GENERAL

The following paragraphs contain illustrations that show the location of each control and indicator for operation of the installed M315 installation kit. Each control and indicator is clearly labeled as it appears on the equipment. Numbers on the illustrations are keyed to the table listing which contains the name and the functional description of each control and indicator.

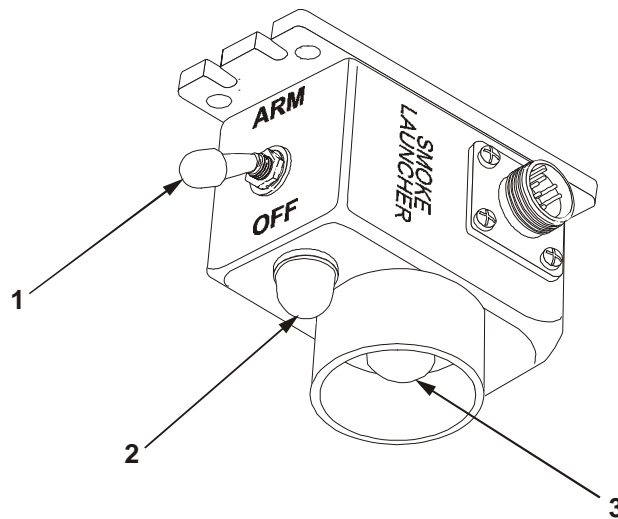
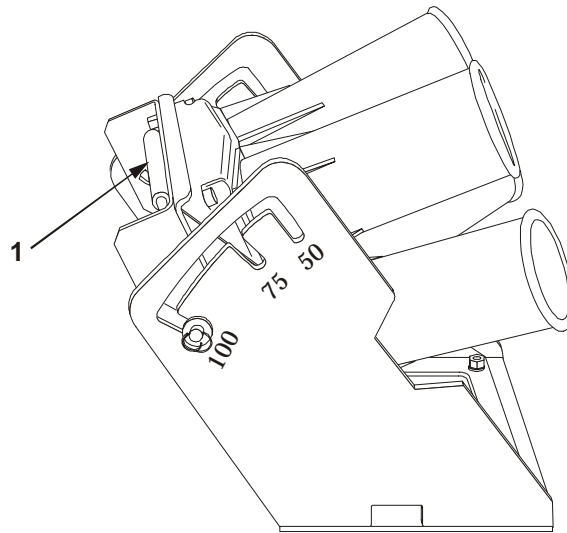
ARMING FIRING UNIT

Table 1. Arming Firing Unit

KEY	CONTROL OR INDICATOR	FUNCTION
1	ARM-OFF switch	Two-position toggle switch used to arm and disarm the discharger. Operator must pull outward on switch to move switch to ARM or OFF.
2	ARM-OFF indicator light	Light comes on when ARM-OFF switch is set to ARM.
3	Fire button	When pushed, fires grenades from discharger tubes.

ADJUSTABLE AIMING BRACKET**Table 2. Adjustable Aiming Bracket**

KEY	CONTROL OR INDICATOR	FUNCTION
1	Handle	<p>Operator can select different firing ranges by lifting and sliding the handle into the appropriate slot. Illustration shows lever in 100M position. The middle slot is 75M and the upper slot is 50M.</p> <p>Only the M98 and M99 grenades may be fired from all three settings. Other grenades must be fired from the 100M setting only.</p>

OPERATOR MAINTENANCE**M315 GRENADE LAUNCHER INSTALLATION KIT****OPERATION UNDER USUAL CONDITIONS – ASSEMBLY AND PREPARATION FOR USE**

INITIAL SETUP:**Materials/Parts**

Vehicle

One installation kit

Personnel Required

Two

References

TM 9-2320-280-10/TM 2320-10/6B

General Safety Instructions

Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry contacts battery terminal, a direct short can result, causing injury to personnel, or damage to equipment.

Equipment Condition

Vehicle turret cover open (TM 9-2320-10/TM 2320-10/6B)

THIS TASK STARTS ON NEXT PAGE

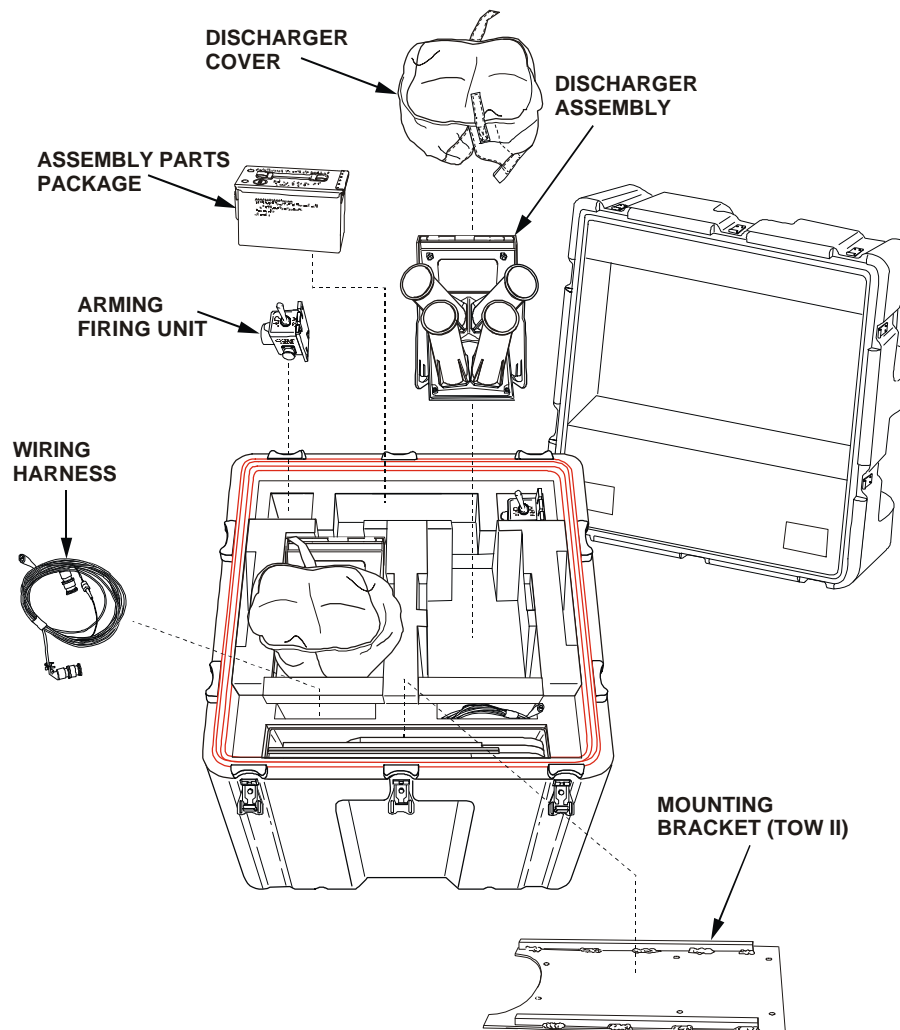
INSTALL TURRET MOUNTING BRACKET (TOW II CONFIGURATION) AND DISCHARGER ASSEMBLY**WARNING**

The M315 Installation Kit weighs 175 lb. To avoid possible back injury, use four people to lift. After the kit is positioned, only two personnel are required to install the components.

NOTE

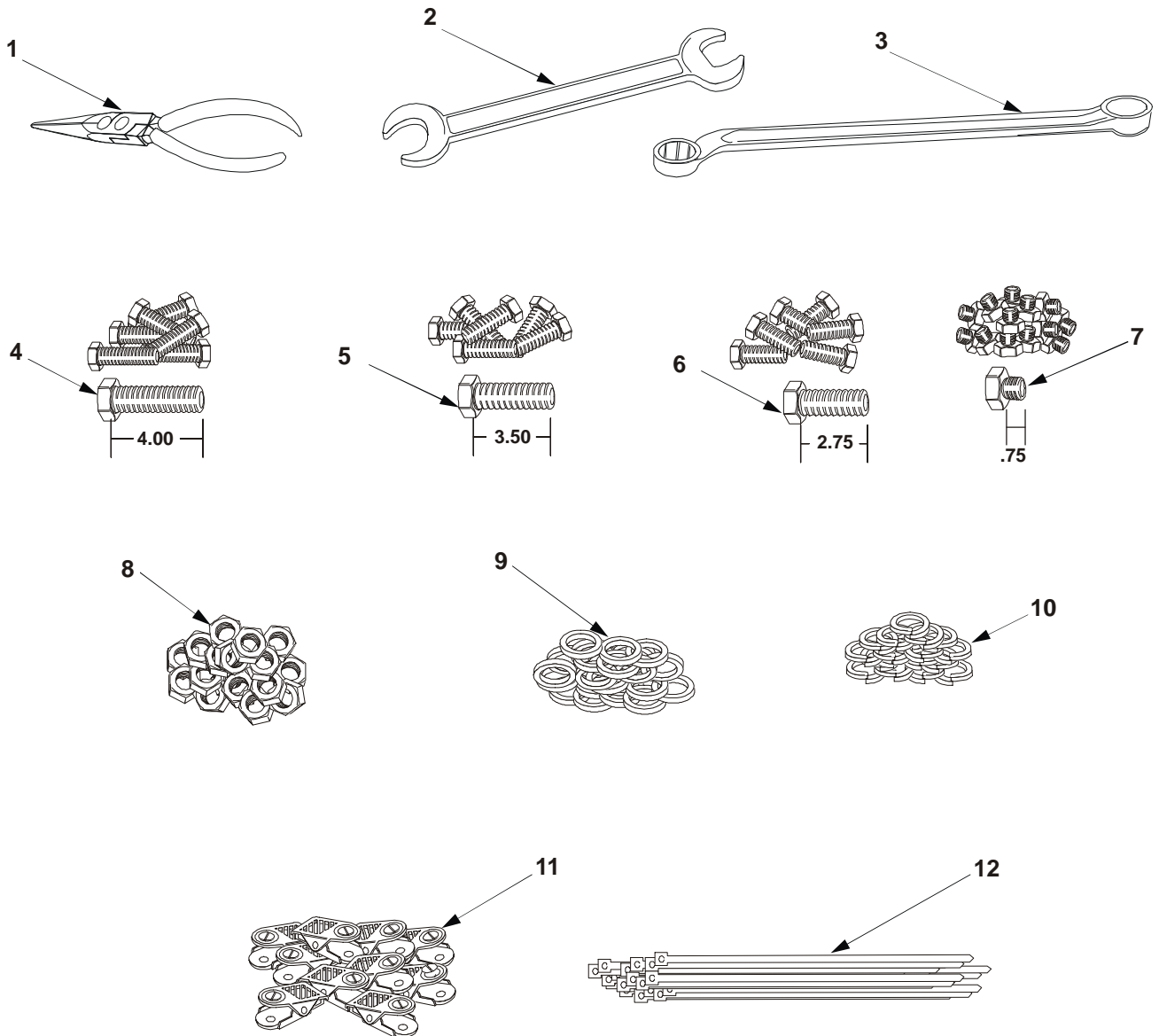
If you have a machine gun-configured vehicle, skip this procedure and go to **INSTALL TURRET MOUNTING BRACKET (MACHINE GUN CONFIGURATION) AND DISCHARGER ASSEMBLY** on page 6.

1. Open the installation kit and remove the following items.



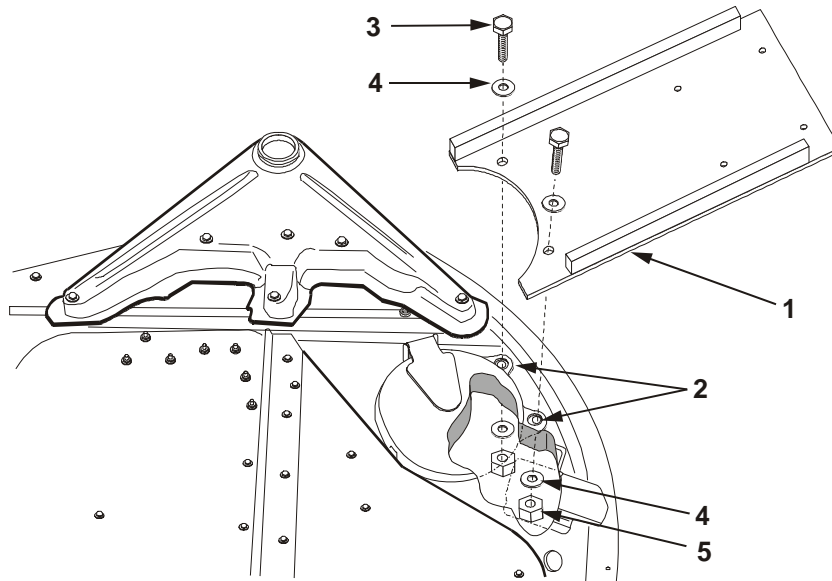
2. Remove the following items from the assembly parts package. You can use the 7-inch ruler below to help measure and identify the bolts.

Needle nose pliers (1)	One 3/8 in. x 4.00 in. bolts (4)	Four 5/16 x .75 in. bolts (7)	Four 5/16 in. lock washers (10)
Open end wrench (2)	One 3/8 in. x 3.50 in. bolts (5)	Two 3/8 in. self-lock nuts (8)	Five metal clips (11)
Box wrench (3)	One 3/8 in x 2.75 in. bolts (6)	Ten 3/8 in. flat washers (9)	Two tiedown straps (12)



INSTALL TURRET MOUNTING BRACKET (TOW II CONFIGURATION) AND DISCHARGER ASSEMBLY - Continued

3. Install the turret mounting bracket (1) as follows:



- a. Remove the two bolts (2) along with their washers and nuts. Save the bolts, washers, and nuts by placing them into the installation kit.
- b. Fill the empty bolt holes with enough flat washer to make a flat surface (about 4 to six in each hole).
- c. Align turret mounting bracket (1) with the bolt holes (2) on the turret ring.

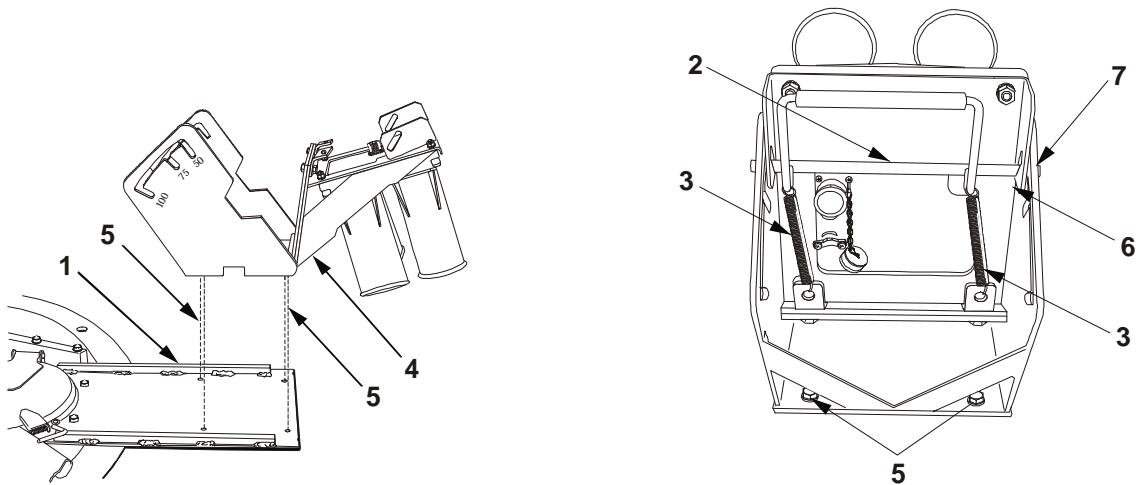
NOTE

In the following step you will need to use only two of the three bolts you removed from the parts package in step 2. You have been given three different sized bolts because each vehicle is slightly different. So you will need to use the bolts that secure the bracket most securely for the vehicle you have. Return the unused bolt to the reusable container.

A properly installed bolt should have at least two threads showing below the nut when tightened.

- d. Install the two bolts (3) that best fit your vehicle with four 3/8 in. flat washers (4) and two lock nuts (5) as illustrated. Adjust and tighten both bolts using the box wrench and open end wrench.

4. Install the discharger assembly to the turret mounting bracket (1) as follows:



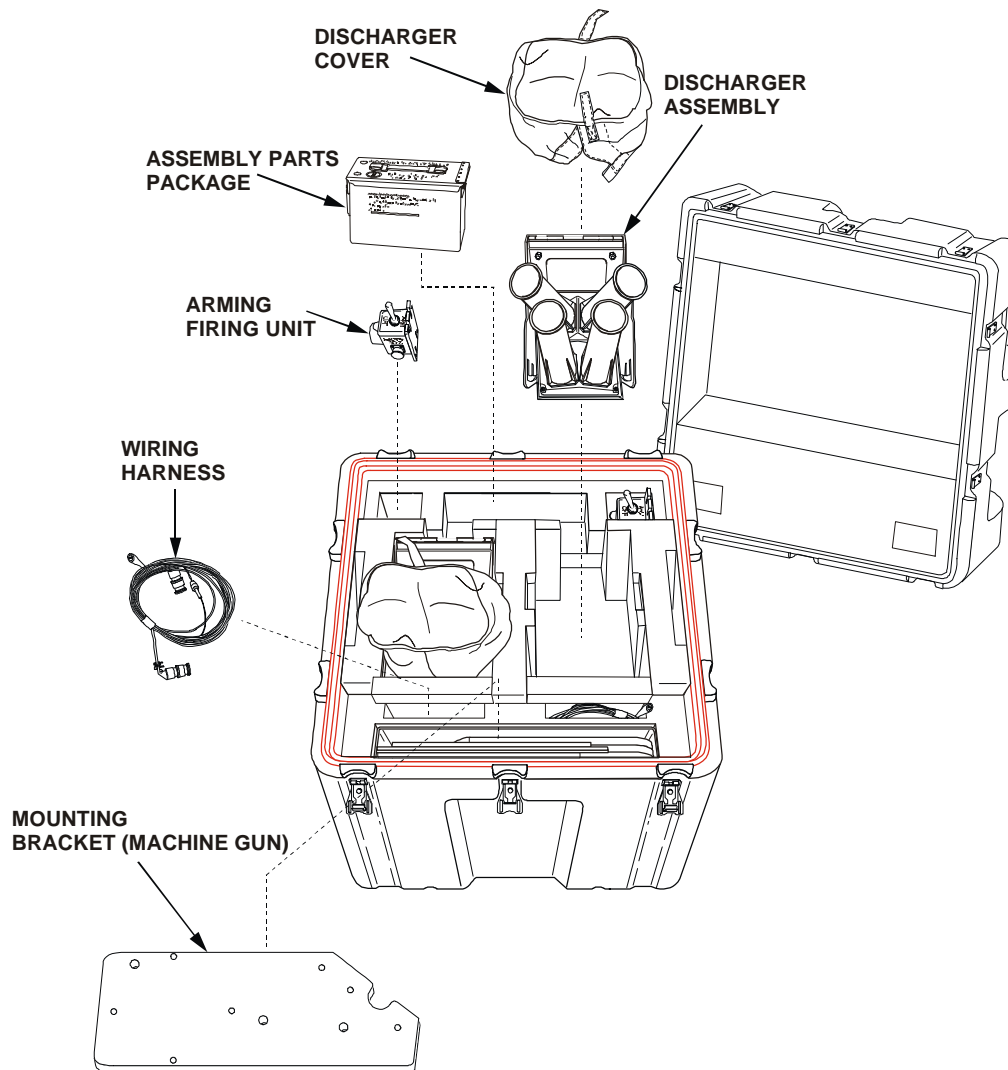
- a. Remove both circle cotters from the ends of the handle (2) and save.
- b. Remove washers from handle and save.
- c. Unhook top of springs (3) from handle (2) and leave bottom of springs attached.
- d. From rear of discharger, remove the handle (2) by:
 - (1) Sliding the handle right.
 - (2) Pulling the left side clear of the elevation bracket.
 - (3) Sliding the handle left until it is free.
 - (4) Save the handle.
- e. Rotate the discharger (4) all the way forward as shown in the illustration.
- f. Align the exposed holes (5) in the base of the adjustable aiming bracket with the threaded holes on the turret mounting bracket (1).
- g. Install and tighten four 5/16 in. bolts and four 5/16 in. lock washers into the exposed holes (5).
- h. Rotate the discharger back into normal firing position. Use care to avoid pinch points.
- i. Install the handle (2) as follows:
 - (1) Position the handle so the curled hooks for the springs curl toward the front of discharger and the left hook will be to the left of the electrical connector. See illustration.
 - (2) Holding the handle in the correct position, insert the right side through the interior (6) and exterior (7) brackets of the adjustable aiming bracket in that order.
 - (3) Slide the handle left through the other pair of slots.
- j. Install the washers you removed in step b.
- k. Insert the circle cotters you removed in step a.
- l. Hook the springs (3) to the base of the handle (2).
- m. Go to **INSTALL ARMING FIRING UNIT** on page 10.

INSTALL TURRET MOUNTING BRACKET (MACHINE GUN CONFIGURATION) AND DISCHARGER ASSEMBLY

WARNING

The M315 Installation Kit weighs 175 lb. To avoid possible back injury, use four people to lift. After the kit is positioned, only two personnel are required to install the components.

1. Open the installation kit and remove the following items.

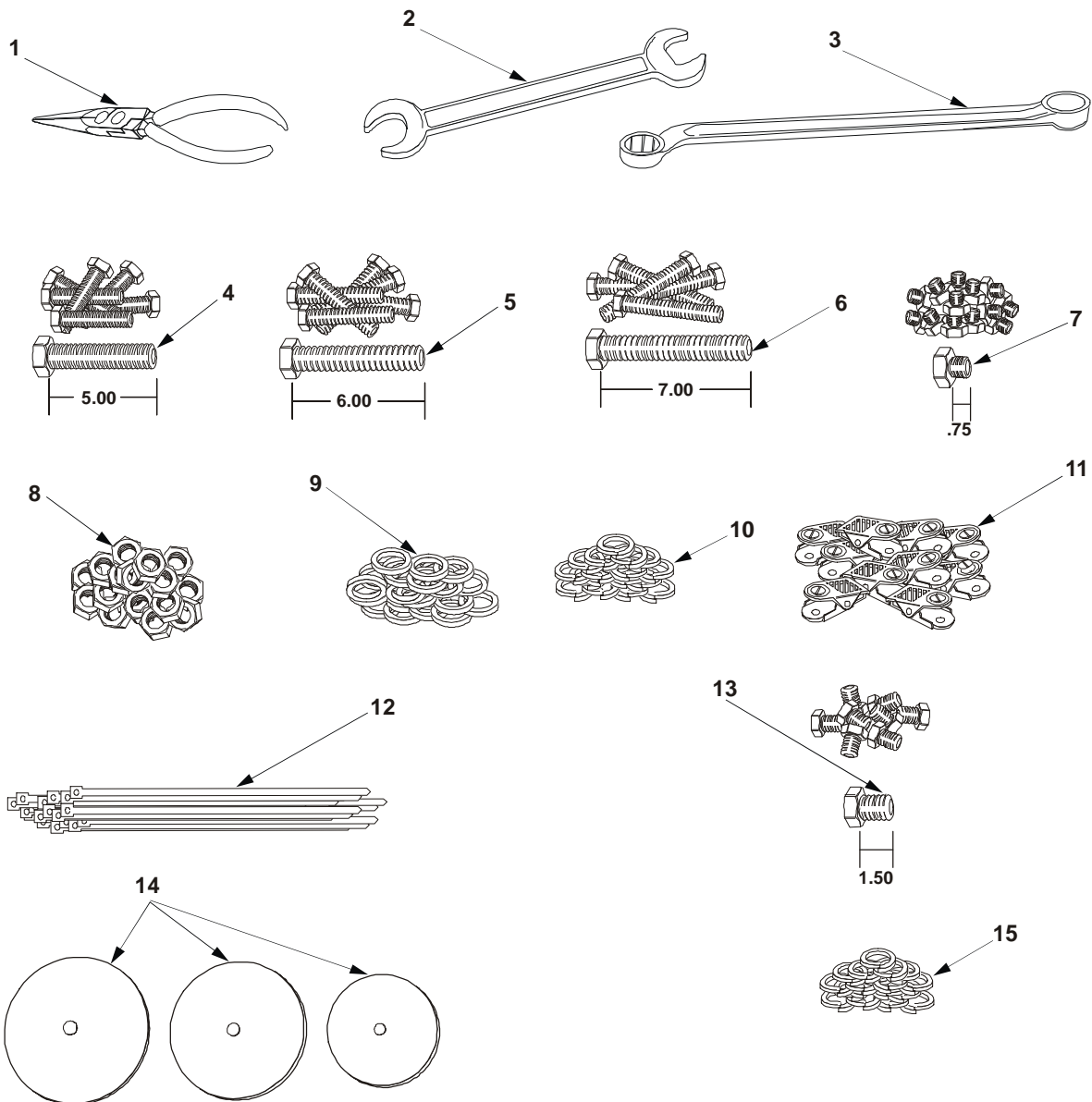


2. Remove the following items from the assembly parts package. You can use the 7-inch ruler on the next page to help measure and identify the bolts.

Needle nose pliers (1)	Four 5/16 in. lock washers (10)	Four 5/16 in. x .75 in. bolts (7)
Open end wrench (2)	Five metal clips (11)	Three 3/8 in. self-lock nuts (8)
Box wrench (3)	Two tiedown straps (12)	Six 3/8 in. flat washers (9)
If you have an A1 bracket on your vehicle remove: Two 3/8 in. x 5.00 in. bolts (4) Two 3/8 in. x 6.00 in. bolts (5) Two 3/8 in. x 7.00 in. bolts (6)		If you have an A2 bracket on your vehicle, remove: Three 3/8 in x 1.5 in. bolts (13) One retaining disk set (14) Three 3/8 in lock washers (15)

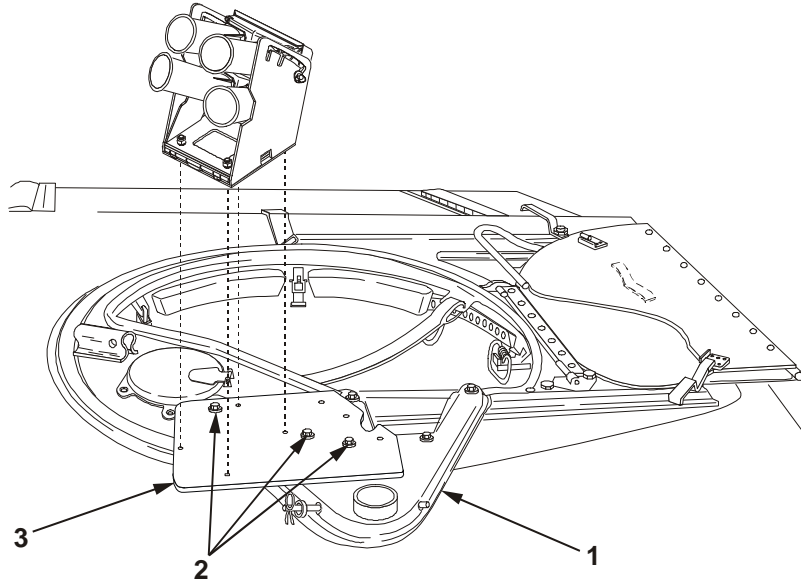
1 in. 2 in. 3 in. 4 in. 5 in. 6 in. 7 in.

0-----[-----[-----[-----[-----[-----[-----[-----[



INSTALL TURRET MOUNTING BRACKET (MACHINE GUN CONFIGURATION) AND DISCHARGER ASSEMBLY - Continued

3. If your vehicle has an A1 armament bracket (1), perform the following steps. If your vehicle has an A2 armament bracket, go to step 4



- a. Remove the three bolts (2), washers, and nuts already mounted in A1 armament bracket and place them into the installation kit.
- b. Align turret mounting bracket (3) with the three bolt holes on the armament bracket (1).

NOTE

In the following step you will need to use only three of the six bolts you removed from the parts package in step 2. You have been given three different sized bolts because each vehicle is slightly different. Use the bolts that secure the bracket most securely for the vehicle you have. Return the unused bolts to the reusable container.

A properly installed bolt should have at least two threads showing below the nut when tightened.

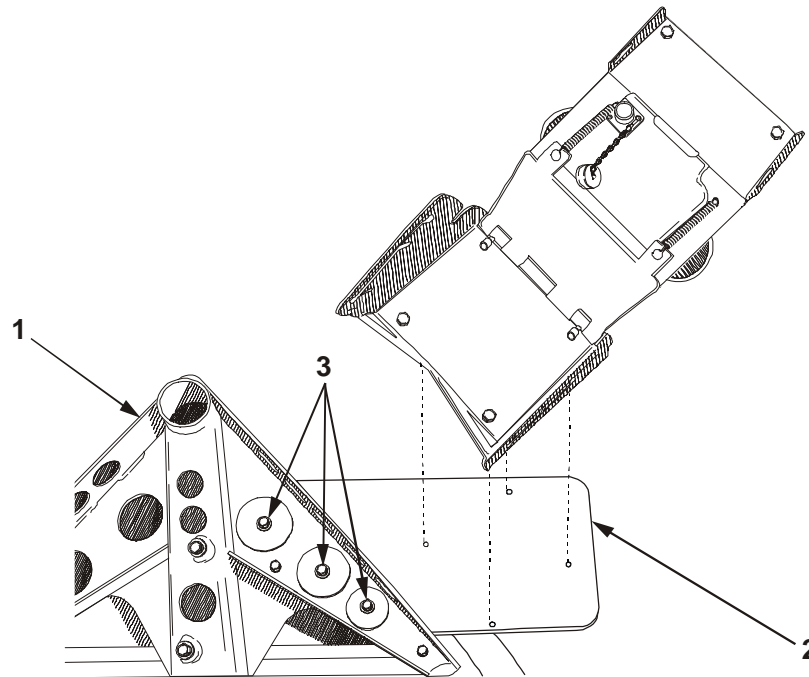
- c. Install the three bolts that best fit your vehicle with six 3/8 in. flat washers (two for each bolt) and three lock nuts. Adjust and tighten both bolts using the box wrench and open end wrench.

NOTE

One flat washer should go on top of the mounting bracket and the other flat washer should go next to the lock nut.

- d. Install the discharger assembly to the turret mounting bracket. (See step 4 on page 5.)

4. If your vehicle has an A2 armament bracket (1), perform the following steps.



- a. Place the turret mounting bracket (2) under the A2 armament bracket.
- b. Align the notch in the turret mounting bracket with the boss under the armament bracket.
- c. Have a helper lift the edge of the turret mounting bracket (2) while you align the three threaded holes of the mounting bracket with the three holes of the retaining rings (3).
- d. Install the 3/8 in. x 1.5 in. bolts, 3/8 in. lock washers, and retaining rings (3) supplied with the kit as shown in the illustration.

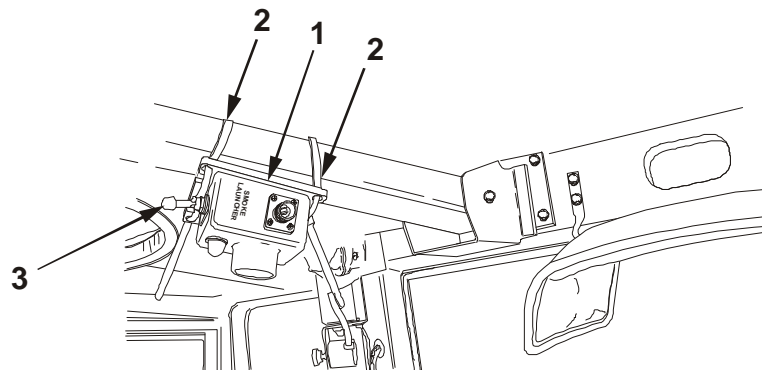
NOTE

The retaining rings come in three different sizes.
Install them in the order you see in the illustration.

- e. Install the discharger assembly to the turret mounting bracket. (See step 4 on page 5.)

INSTALL ARMING FIRING UNIT

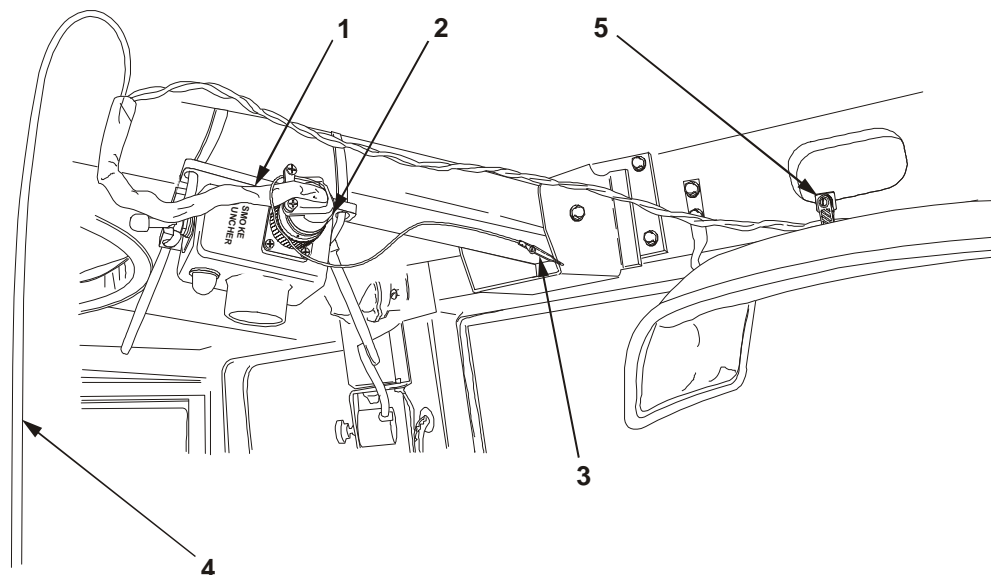
1. While sitting in front passenger seat, attach the arming firing unit (1) to the cross beam as shown using the tie down straps (2). Cut off any excess strap using needle nose pliers.



2. Ensure arming firing unit ARM/OFF switch (3) is in OFF position.

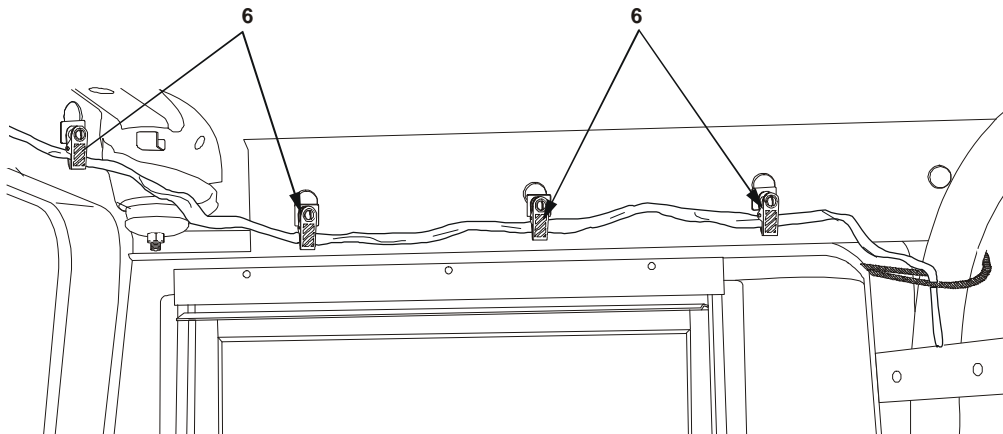
INSTALL WIRING HARNESS

1. Separate wires of the harness and locate the arming firing unit connector with six pins (1).

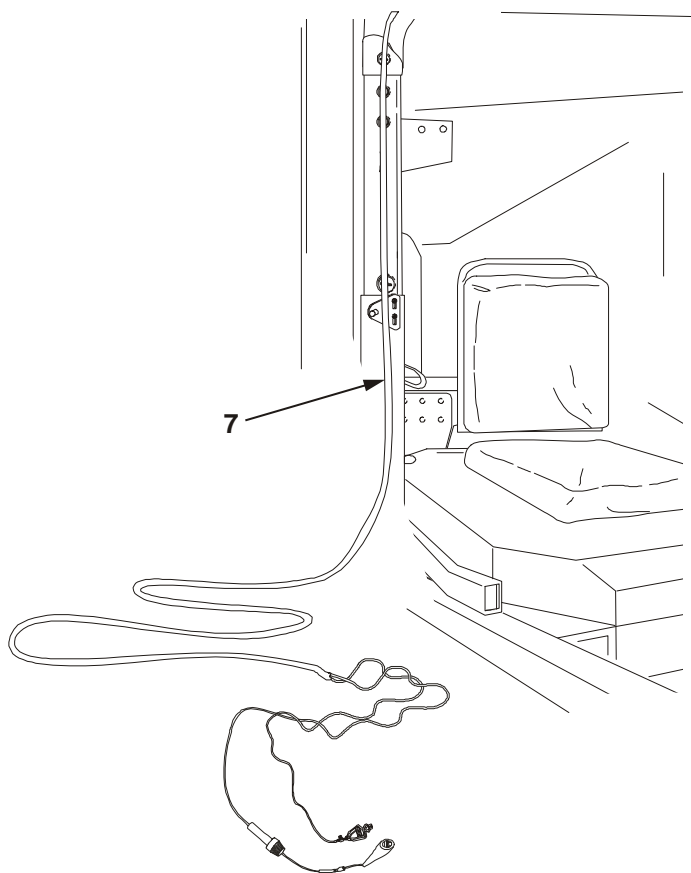


2. Connect the six-pin connector to arming firing unit electrical receptacle (2).
3. Anchor the ground wire (3) on wiring harness to the vehicle as shown above and ensure a good contact is made for electrical ground.
4. Let the three pin connector cable for the discharger (4) hang for later installation.
5. Secure the two battery wires, leading from the arming firing unit connector, to vehicle as shown using one metal clip (5).

6. Attach the battery wires above passenger side window and corner of roof using four metal clips (6) as illustrated.

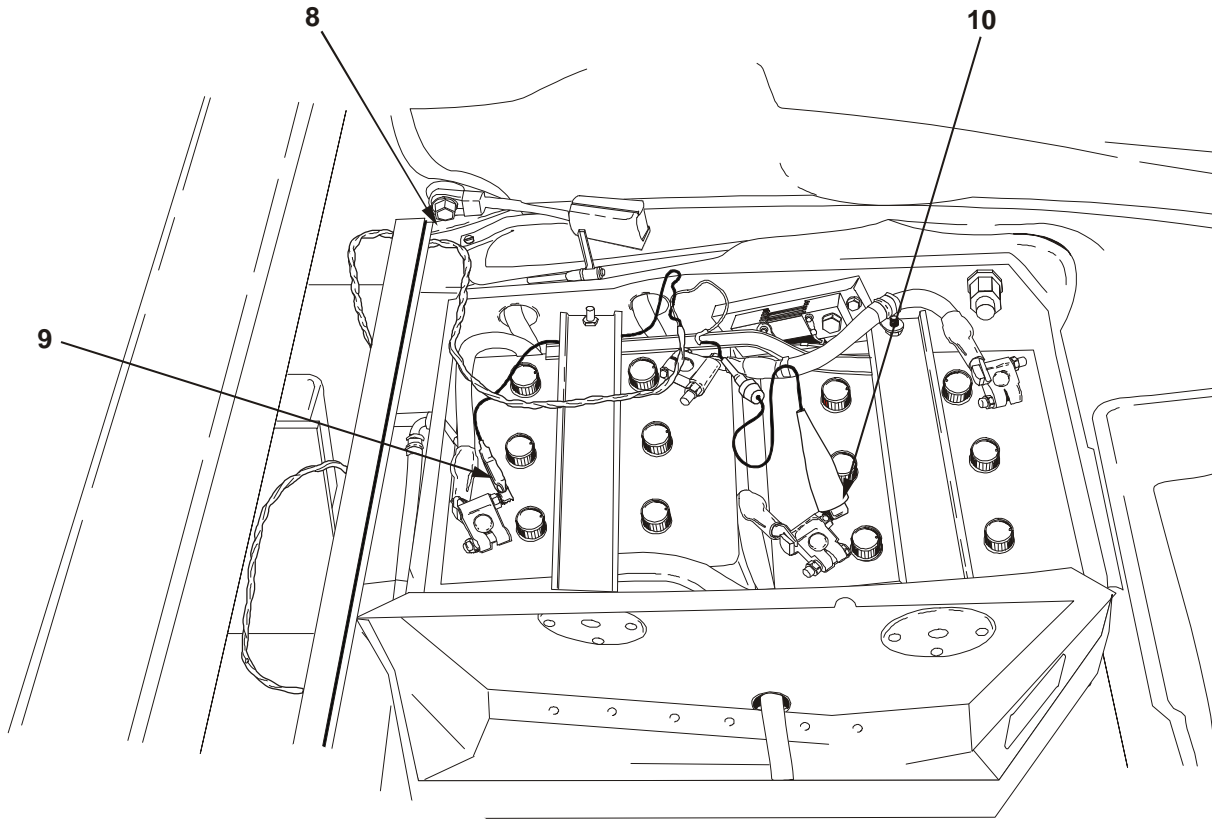


7. Allow the battery wire (7) to trace behind the vehicle side post and seat belt bracket. Keep it protected and out of the way as much as possible.



INSTALL WIRING HARNESS - Continued

8. Access vehicle battery (TM 9-2320-280-10/TM 2320-10/6B) by removing front passenger seat and route the battery wire through cutout (8) at rear right corner of passenger seat.

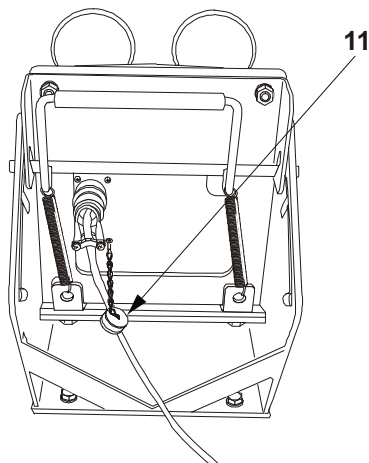


9. Connect the thin black wire (9) to negative terminal of one battery and thin white wire (10) to positive terminal of other battery as shown using clips at end of harness. Then return passenger seat to original position.

10. Insert 3-pin connector of wiring harness through turret opening and connect to rear of discharger.

NOTE

The protective cap (11) should be installed whenever the wiring harness is not connected.



11. Perform BEFORE PMCS (0011 00)
12. Place the discharger cover over the discharger tubes until ready for operation.
13. Store this TM with the vehicle's operator TM.

END OF WORK PACKAGE

LOADING GRENADES INTO DISCHARGERS – Continued**WARNING**

Electrical trouble could cause grenades to launch and kill or injure personnel. Make sure ARM/OFF switch is OFF before you load grenades. Do not place any part of your body in front of dischargers after loading them.

CAUTION

Grenades can fail to fire. Keep grenades free of dirt and grease. Do not let firing contacts be damaged.

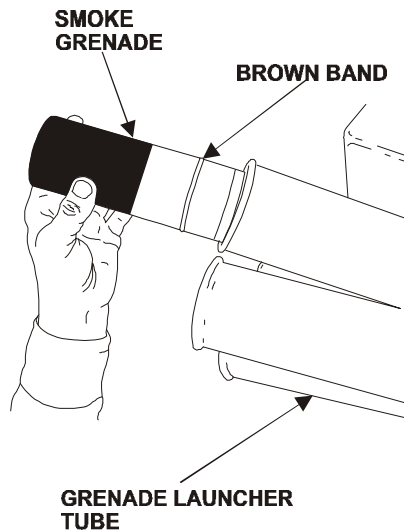
4. Grip grenade and insert grenade into discharger tube with electric contact end down. Gently push grenade down into tube so the spring clip at base of grenade engages tip plug at bottom of tube.

CAUTION

You will feel two distinct clicks as both clips seat on the firing pin. If there are not two clicks, the grenade may fail to fire.

NOTE

The illustration below shows an M90 grenade. If you are loading a different grenade the markings will be different but the procedure is the same.



5. Rotate grenade 1/4 turn to ensure good electrical contact.

LAUNCHING GRENADES

WARNING

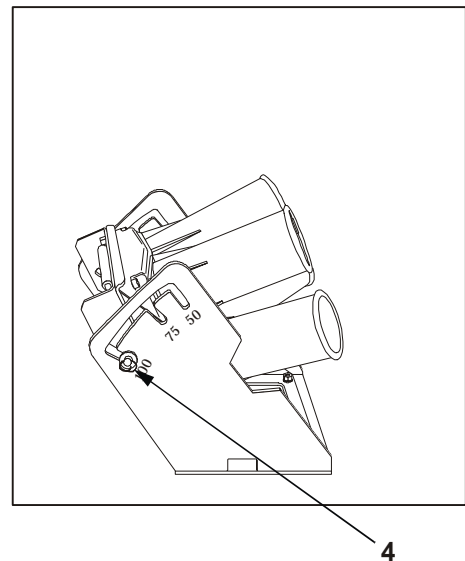
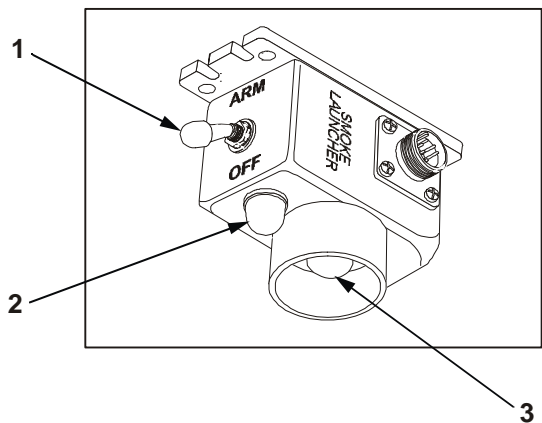
Grenades could accidentally fire. To avoid possible death or injury, do not place any part of your body in front of a loaded discharger. If misfired grenades launch during unloading, personnel in the area could be killed or injured. Keep vehicle pointed down range until grenades are removed.

Grenades can kill or injure personnel. Handle grenades with care. Do not drop or throw grenades. Do not use damaged grenades. Keep grenades away from electric sparks. Keep containers sealed until you are ready to use grenades.

When operating the discharger at any elevation, be careful not to aim the discharger at other vehicle mounted equipment.

DO NOT fire an M90, L96A1, or L97A1 grenade from the 50M or 75M settings on the adjustable aiming bracket. Be familiar with grenade range data in WP 0002 00.

1. Adjust the elevation lever (4) on the aiming bracket for required launch distance.
2. Place ARM/OFF switch (1) to ARM. Check that indicator light (2) comes on.
3. Press FIRE button (3) to launch grenades. The button launches all four grenades.
4. Place ARM/OFF switch to OFF. Check that indicator light goes off.
5. As soon as tactical situation permits, check that all grenades have been launched. If any grenades did not fire, see HANGFIRE, MISFIRE, AND DUD PROCEDURES on following page.



HANGFIRE, MISFIRE, AND DUD PROCEDURES

WARNING

If misfired grenades launch during unloading, personnel in the area could be killed or injured. Keep vehicle pointed down range until grenades are removed.

Use extreme caution when operating this equipment. Be sure to read and understand the warnings at the front of this manual.

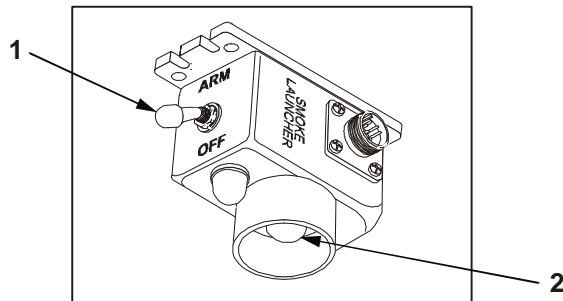
NOTE

A hangfire is a temporary failure or delay in the action of the propellant charge. A misfire is the failure of an L96A1 or L97A1 grenade to launch from discharger tube or for an M90/M98/M99 grenade canister to eject from the grenade tube. A dud is:

An M90, M98, or M99 grenade that has fired its payload from a grenade tube but one or more of the canisters have failed to burn or explode.

An L96A1 or L97A1 grenade that failed to disperse its payload once it has launched.

1. For HANGFIRE:
 - a. Wait ten seconds and then make two more tries to launch grenade within a ten-second interval.
 - b. Wait five minutes. If grenade still does not launch, treat as a MISFIRE and go to next step.
2. For MISFIRE:
 - a. Ensure ARM/OFF switch (1) is set to ARM and press FIRE button (2).



- b. If grenade does not fire, place ARM/OFF switch to OFF; check that grenade is firmly seated in discharger tube.
 - c. Place ARM/OFF switch to ARM and press FIRE button.
 - d. If grenade does not fire, turn ARM/OFF switch to OFF, attempt to fire grenade from another discharger tube (see LAUNCHING GRENADES previous page).
 - (1) When moving grenade make sure to hold grenade away from body and pointed down range.
 - (2) If grenade fires, notify unit maintenance of defective discharger tube.
 - (3) If grenade still does not fire, treat as a DUD and go to next step.
3. For DUDs, after waiting 15 minutes, discard in accordance with Unit SOP. In a training situation, wait 15 minutes; then notify EOD personnel and give the type, quantity, and precise location of the dud.

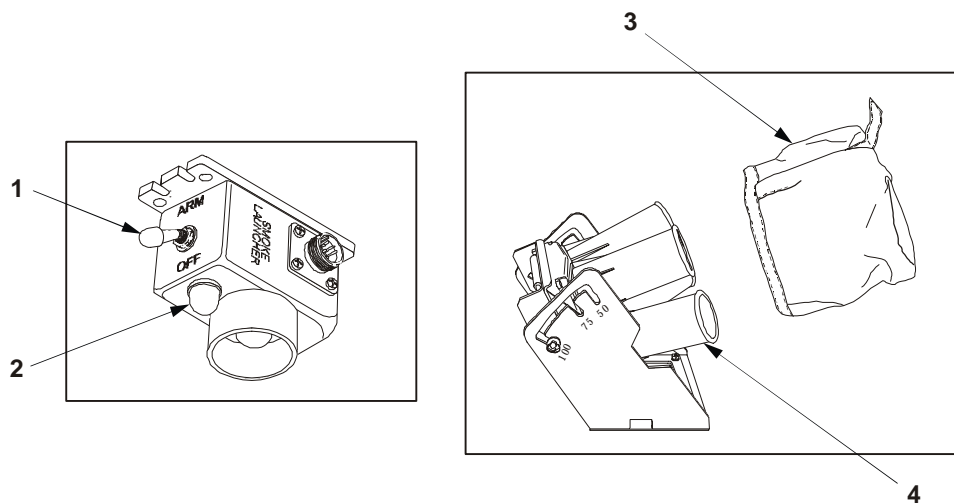
UNLOADING GRENADE DISCHARGERS

WARNING

Electrical trouble could cause grenades to launch and kill or injure personnel. Make sure ARM/OFF switch is OFF before unloading grenades. Do not place any part of your body in front of grenade dischargers.

Heat could set off grenades and kill or injure personnel. Do not place grenades on hot surfaces.

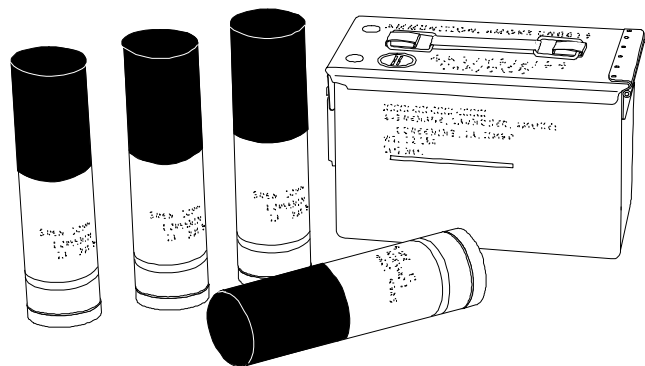
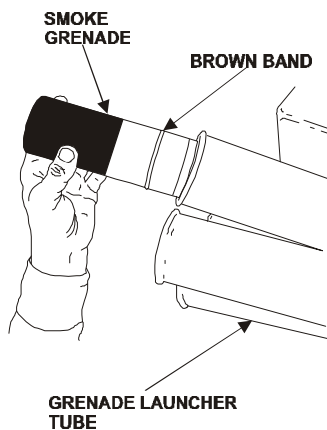
1. Place ARM/OFF switch (1) to OFF.
2. Remove grenades from discharger tubes and place in ammo can.



3. Install discharger cover (3) on launcher tubes (4) and secure grenades in accordance with Unit SOP.

NOTE

The illustration below shows an M90 grenade. If you are unloading a different grenade the markings will be different but the procedure is the same.



END OF WORK PACKAGE

OPERATOR MAINTENANCE**M315 GRENADE LAUNCHER INSTALLATION KIT****OPERATION UNDER USUAL CONDITIONS – DISASSEMBLY AFTER USE**

INITIAL SETUP:**Materials/Parts**

Vehicle

Installation kit resuseable container (from assembly)

Personnel Required

Two

General Safety Instructions

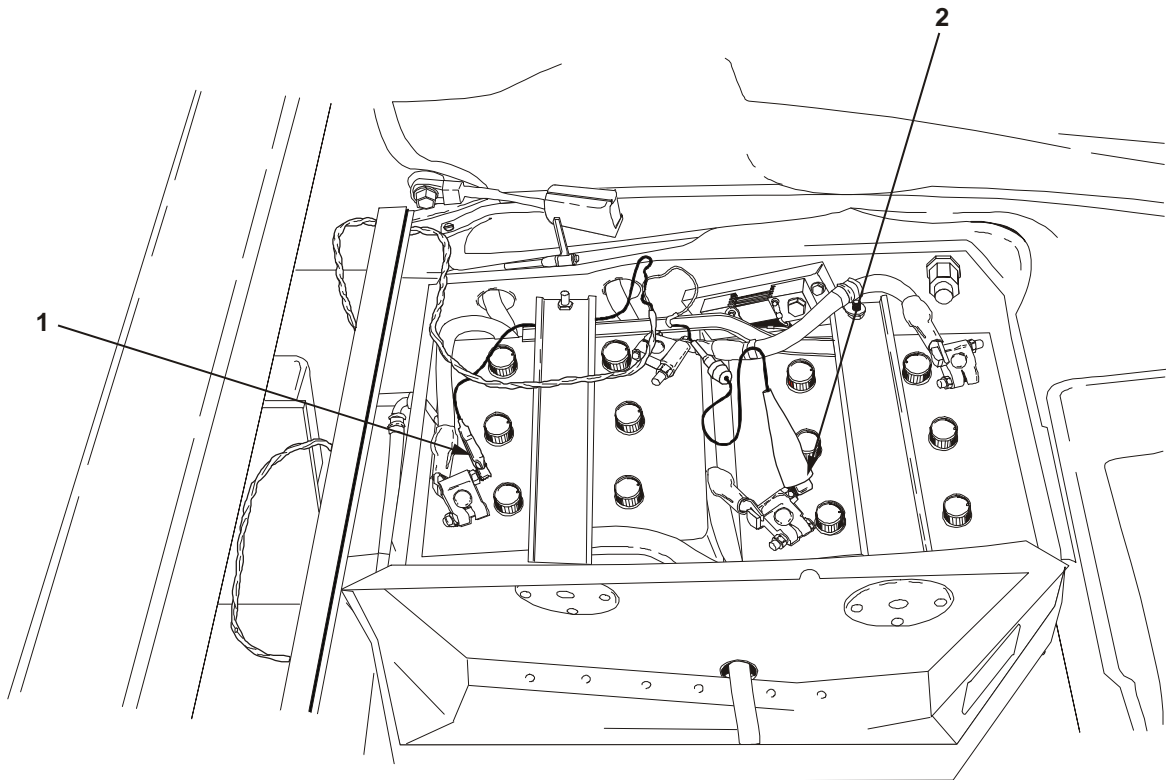
Remove all jewelry such as rings, dog tags, bracelets, etc. If jewelry contacts battery terminal, a direct short can result, causing injury to personnel, or damage to equipment.

References

TM 9-2320-280-10/TM 2320-10/6B

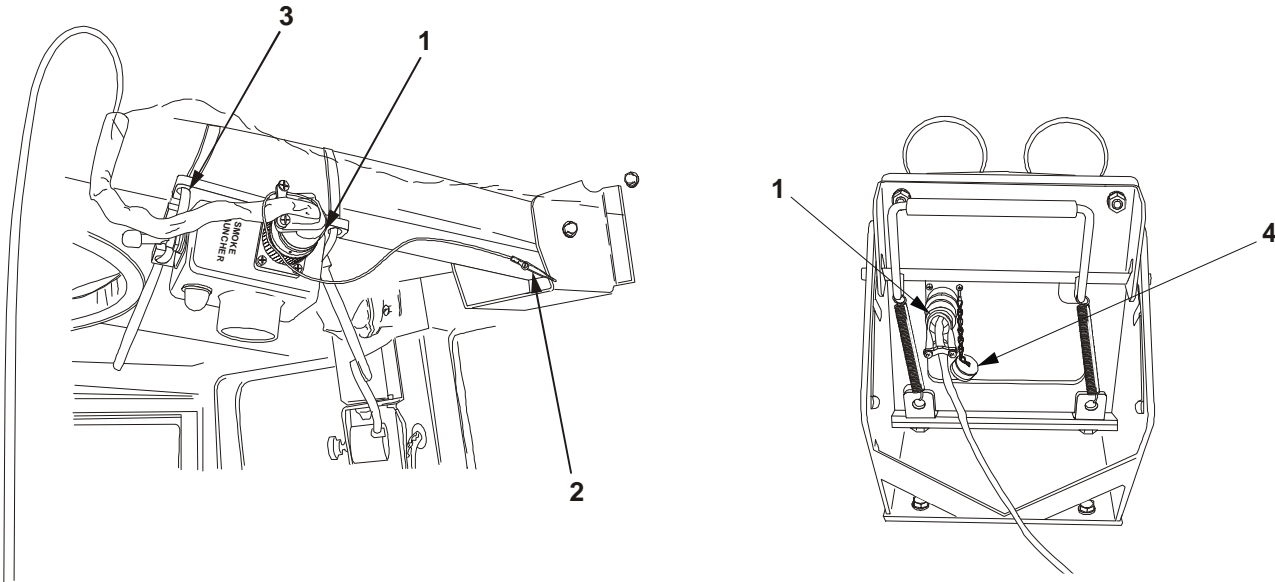
REMOVE WIRING HARNESS

1. Perform AFTER PMCS (WP0011 00).
2. Access the vehicle's batteries located under the passenger side seat (TM 9-2320-280-10).
3. Disconnect black wire (1) and white wire (2) and remove wires from compartment. Then return passenger seat to original position.



REMOVE WIRING HARNESS – CONTINUED

4. Remove plug connectors (1) from receptacle connector on side of arming firing unit and back of discharger by turning counterclockwise and pulling. Disconnect the ground wire (2). Connect the protective cap (4) to receptacle connector.



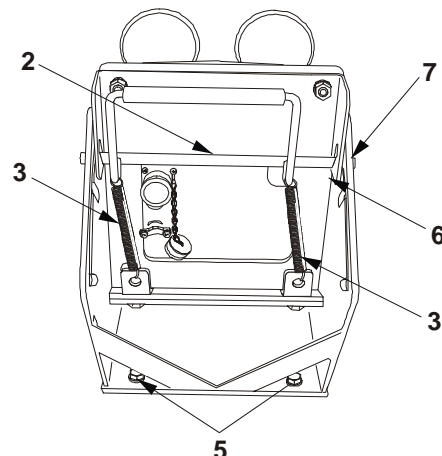
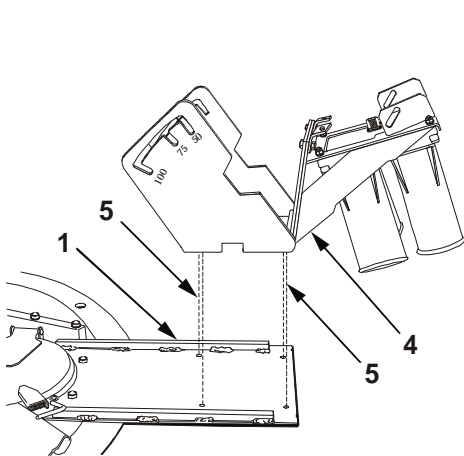
5. Trace along the entire length of the harness and detach harness and each metal clip holding the harness.
6. Coil the harness and return it and the metal clips to the reusable container.

REMOVE ARMING FIRING UNIT

1. Obtain the needle nose pliers from the assembly parts package in the installation kit.
2. Ensure arming firing unit ARM/OFF switch in OFF position.
3. While sitting in front passenger seat remove the tie down straps (3) from the arming firing unit using the needle nose pliers and return the arming firing unit to the installation kit.

REMOVE TURRET MOUNTING BRACKET (TOW II CONFIGURATION) AND DISCHARGER ASSEMBLY

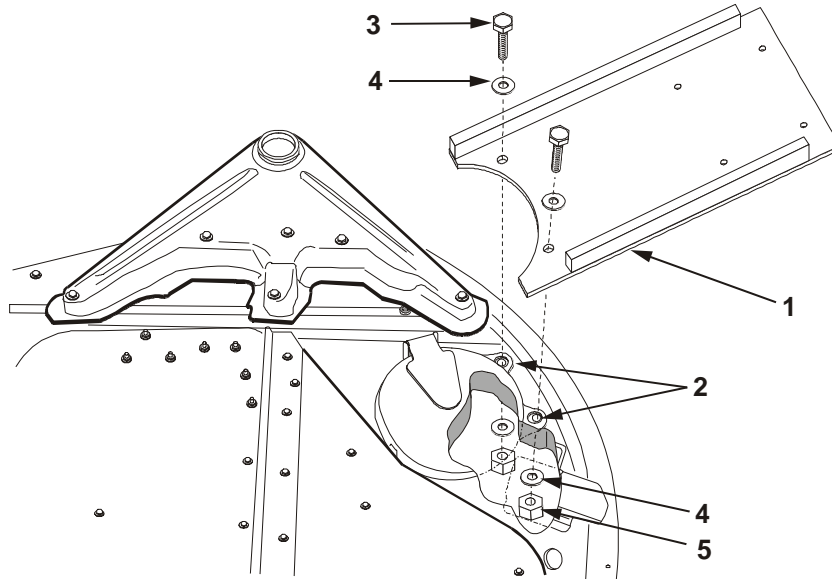
1. Obtain the box wrench and open end wrench from the assembly parts package in the installation kit.
2. Remove the discharger assembly from the turret mounting bracket (1) as follows:



- a. Remove both circle cotters from the ends of the handle (2) and save.
- b. Remove washers from handle and save.
- c. Unhook top of springs (3) from handle (2) and leave bottom of springs attached.
- d. From rear of discharger, remove the handle (2) by:
 - (1) Sliding the handle right.
 - (2) Pulling the left side clear of the elevation bracket.
 - (3) Sliding the handle left until it is free.
 - (4) Save the handle.
- e. Rotate the discharger (4) all the way forward as shown in the illustration.
- f. Remove four 5/16 in. bolts and four 5/16 in. lock washers (5). Discard lock washers and return bolts to reusable container. Notify unit maintenance to restock lock washers in installation kit.
- g. Rotate the discharger back into normal firing position. Use care to avoid pinch points.
- h. Install the handle (2) as follows:
 - (1) Position the handle so the curled hooks for the springs curl toward the front of discharger and the left hook will be to the left of the electrical connector. See illustration.
 - (2) Holding the handle in the correct position, insert the right side through the interior (6) and exterior (7) brackets of the adjustable aiming bracket in that order.
 - (3) Slide the handle left through the other pair of slots.
- i. Install the washers you removed in step b.
- j. Insert the circle cotters you removed in step a.
- k. Hook the top of springs (3) to the base of the handle (2).
- l. Remove the discharger assembly and return it to the reusable container.

REMOVE TURRET MOUNTING BRACKET (TOW II CONFIGURATION) AND DISCHARGER ASSEMBLY - Continued

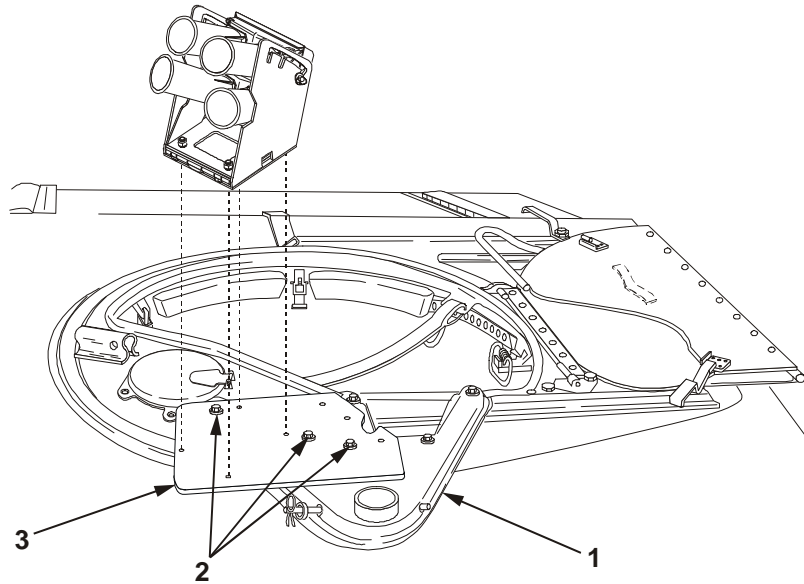
3. Remove the turret mounting bracket (1) as follows:



- a. Remove the two bolts, washers, and nuts (3, 4, and 5). Save the mounting hardware by placing them into the assembly parts package.
- b. Remove the turret mounting bracket (1) and return it to the reusable container.
- c. Remove all the washers in each bolt hole (2) and return to reusable container.
- d. Remove the bolts, washers, and nuts from the installation kit that you saved during installation.
- e. Install the two bolts, washers, and nuts back into the turret pedestal (2).

REMOVE THE TURRET MOUNTING BRACKET (MACHINE GUN CONFIGURATION) AND DISCHARGER ASSEMBLY

1. If your vehicle has an A1 armament bracket (1), perform the following steps. If your vehicle has an A2 armament bracket go to step 2.



- a. Remove the discharger assembly from the turret mounting bracket. (See steps 1 and 2 on page 3.)
- b. Remove the three bolts (2), washers, and nuts from the A1 armament bracket (1). Save the mounting hardware by placing them into the installation kit.
- c. Remove the turret mounting bracket (3) and return it to the installation kit reusable container along with the hardware removed in step b.
- d. Remove the three bolts, washers and nuts from the installation kit that you saved during installation.
- e. Install the three bolts, washers, and nuts back into the A1 armament bracket.

OPERATOR MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
OPERATION UNDER UNUSUAL CONDITIONS

OPERATION UNDER UNUSUAL CONDITIONS

Freezing rain could cause the adjustable aiming bracket to become stuck in one position. Dust or sand could cause the same condition. If this occurs, remove any loaded grenades before attempting to unstick the bracket or adjust the angle.

While equipment is not in operation, be sure to keep discharger covers in place to keep rain, snow, or debris from possibly damaging the firing pins.

CHAPTER INDEX OF WORK PACKAGES

CHAPTER 3

OPERATOR TROUBLESHOOTING PROCEDURES

This chapter contains the following Work Packages:

Introduction, Malfunction Index, and Troubleshooting Procedures 0009 00

OPERATOR MAINTENANCE**M315 GRENADE LAUNCHER INSTALLATION KIT****INTRODUCTION, MALFUNCTION INDEX, AND TROUBLESHOOTING PROCEDURES**

INTRODUCTION

The malfunction/symptom index located in the next paragraph is a quick reference for finding troubleshooting procedures. Specific malfunctions are listed which you might see while using the grenade launcher. The index tells you which page of this work package contains troubleshooting procedures for the malfunction/symptom you see.

This manual cannot list all malfunctions that may occur, or all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

MALFUNCTION INDEX

Malfunction (Symptom)	Page No.
Discharger Won't Fire	0009 00-2
Indicator Lamp Won't Light	0009 00-2

INITIAL SETUP:**References**

TM 9-2320-280-10/TM 2320-10/6B

Materials/Parts

Lamp (on-board spare)

Fuse (on-board spare)

DISCHARGER WON'T FIRE

1. Ensure ARM/OFF switch is set to ARM and refire.

If discharger still does not fire, go to next step.

2. Ensure cable connections to discharger and arming firing unit are securely connected and fire again.

If discharger still does not fire, go to next step.

3. Ensure grenades are properly loaded (WP 0006 00).

If discharger still does not fire, notify unit maintenance.

INDICATOR LAMP WON'T LIGHT

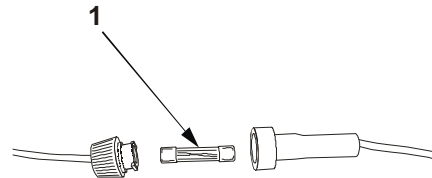
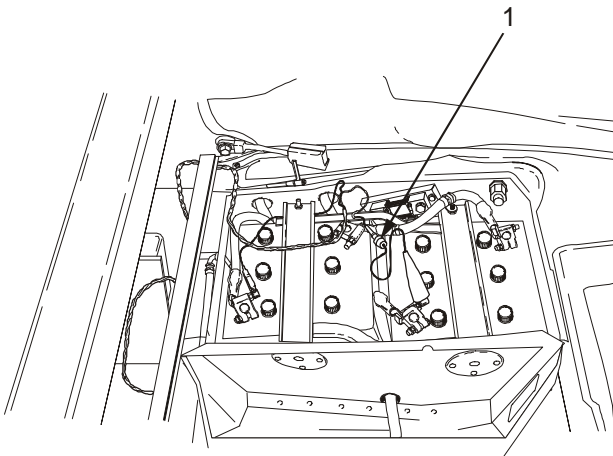
1. Verify lamp is screwed in tightly.

If indicator lamp still does not light go to next step.

2. Using on-board spare indicator lamp, replace the lamp (WP 0012 00).

If spare lamp does not light, go to next step.

3. Access the battery under the passenger seat and check if wiring harness is properly connected to battery and if fuse (1) is blown. Using on-board spare fuse, replace fuse if blown (WP 0012 00).

**NOTE**

A blown fuse will show black around the glass or you will see a broken wire in the tube.

If indicator lamp still does not light, notify unit maintenance.

END OF WORK PACKAGE

CHAPTER INDEX OF WORK PACKAGES

CHAPTER 4

UNIT TROUBLESHOOTING PROCEDURES

This chapter contains the following Work Packages:

Introduction, Malfunction Index, and Troubleshooting Procedures 0010 00

UNIT MAINTENANCE**M315 GRENADE LAUNCHER INSTALLATION KIT**

INTRODUCTION, MALFUNCTION INDEX, AND TROUBLESHOOTING PROCEDURES

INTRODUCTION

The malfunction/symptom index located in the next paragraph is a quick reference for finding troubleshooting procedures. Specific malfunctions are listed which you might see while using the grenade launcher. The index tells you which page of this work package contains troubleshooting procedures for the malfunction/symptom you see.

This manual cannot list all malfunctions that may occur, or all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

MALFUNCTION INDEX

Malfunction (Symptom)	Page No.
Discharger Won't Fire	0010 00-2
Indicator Lamp Won't Light	0010 00-8

INITIAL SETUP:**Reference**

TM 902320-280-10/TM 2320-10/6B

Tools/Materials

Wiping rag (Item 4, WP 0034 00)

Multimeter

DISCHARGER WON'T FIRE**NOTE**

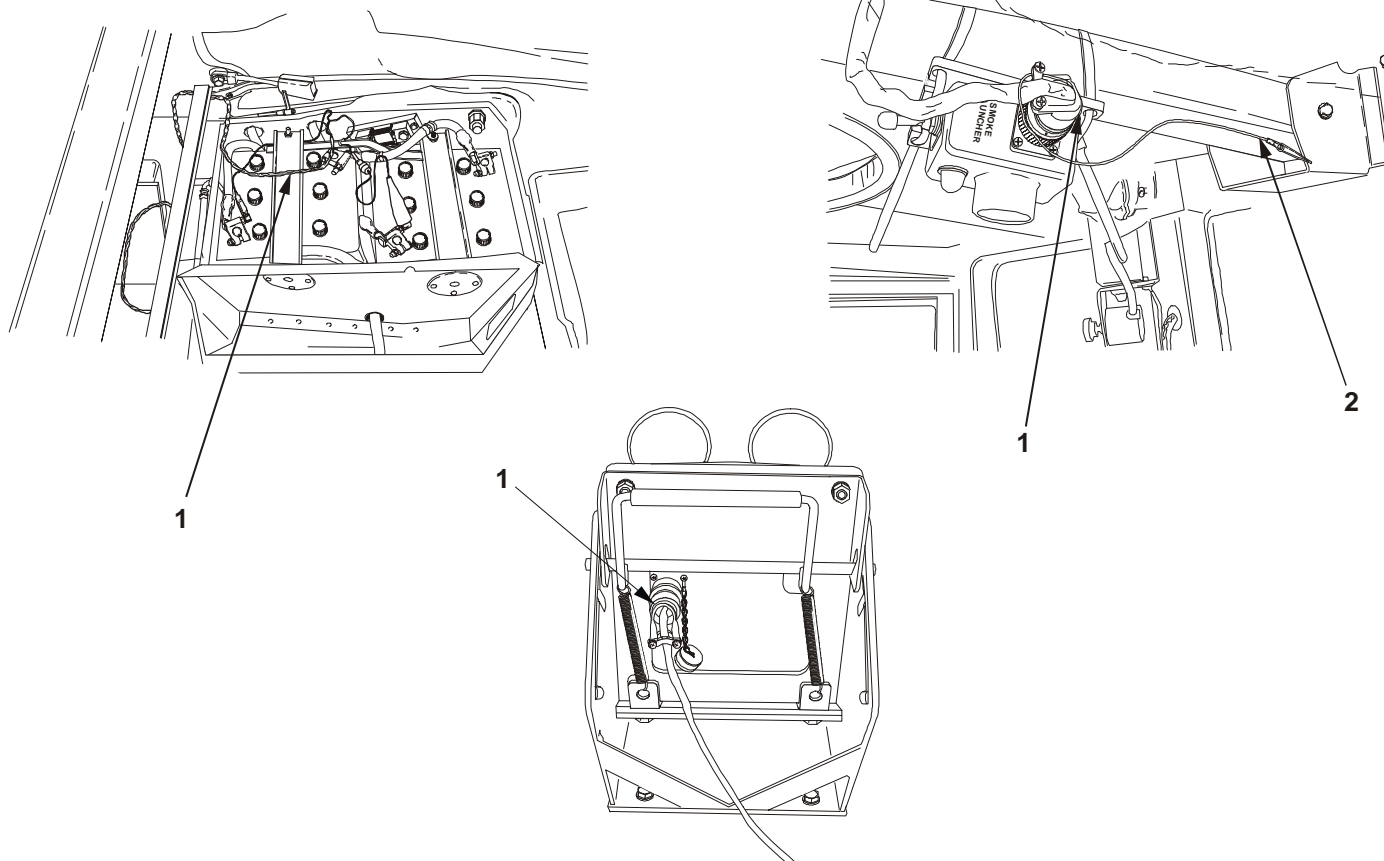
Ensure black ground wire of wiring harness is disconnected from vehicle battery.

Do not let multimeter probe touch electrical receptacle connector shell. This will cause false meter reading.

Ensure good contact by multimeter probe on test point. Poor contact will cause false meter reading.

Check key on electrical receptacle connector to locate position of pins A through C.

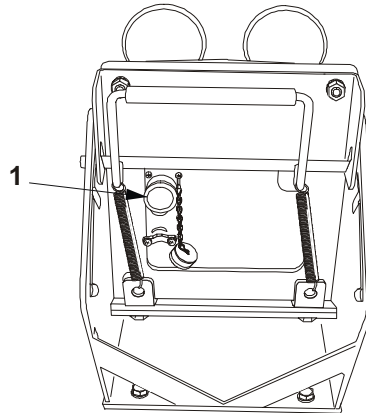
1. Disconnect the wiring harness (1) from the batteries, the arming firing unit, and the discharger. Disconnect the arming firing unit grounding wire clip (2) from the vehicle.



2. Inspect connector (1) for broken shell and broken, bent, or missing pins.

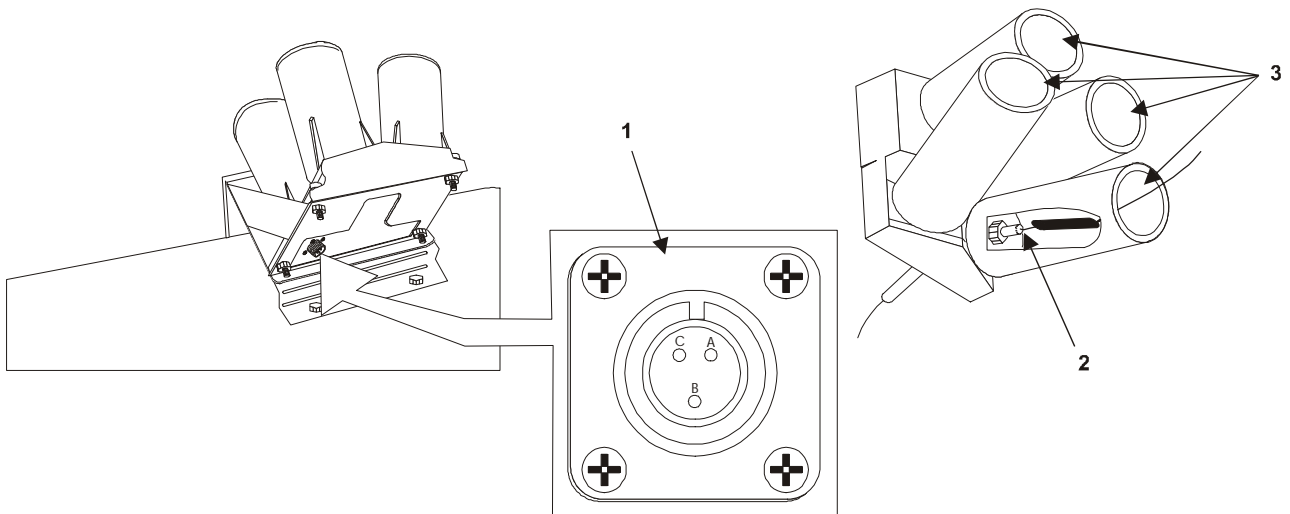
If no damage, go to step 3.

If pins are bent, straighten, then go to step 3.



3. Check resistance of discharger as follows:

- a. Set multimeter to ohms and zero multimeter. Touch red probe to pin A of connector (1). Touch black probe to tip of electrical firing pin (2) in each discharger tube (3). NOTE: Be sure to touch tip of pin in this step.

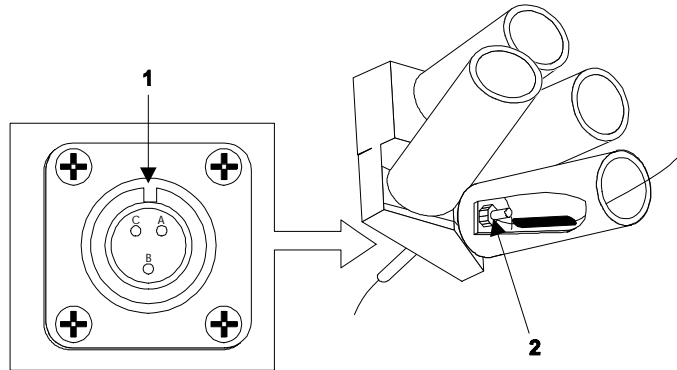


If meter reads from 13 to 18 on OHMS scale for all four checks, no fault. Go to next step.

If meter reads below 13 or above 18 on OHMS scale for any of the four checks, resistor inside discharger is faulty. Replace discharger (WP 0016 00).

DISCHARGER WON'T FIRE – Continued

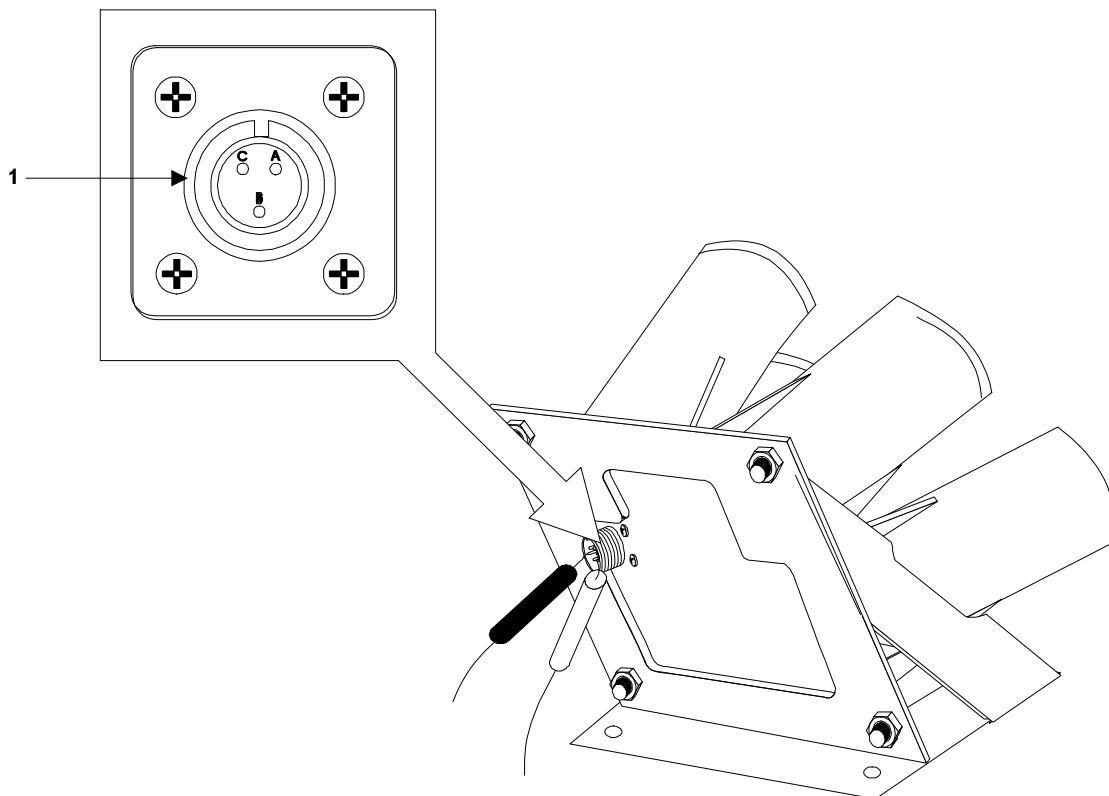
- b. Set multimeter to ohms and zero multimeter. Touch red probe to pin C of connector (1). Touch black probe to base of firing pin (2) in each discharger tube.



If meter reads less than 5 on OHMS scale, no fault. Go to next step.

If meter reads 5 or above on OHMS scale, replace discharger (WP 0016 00).

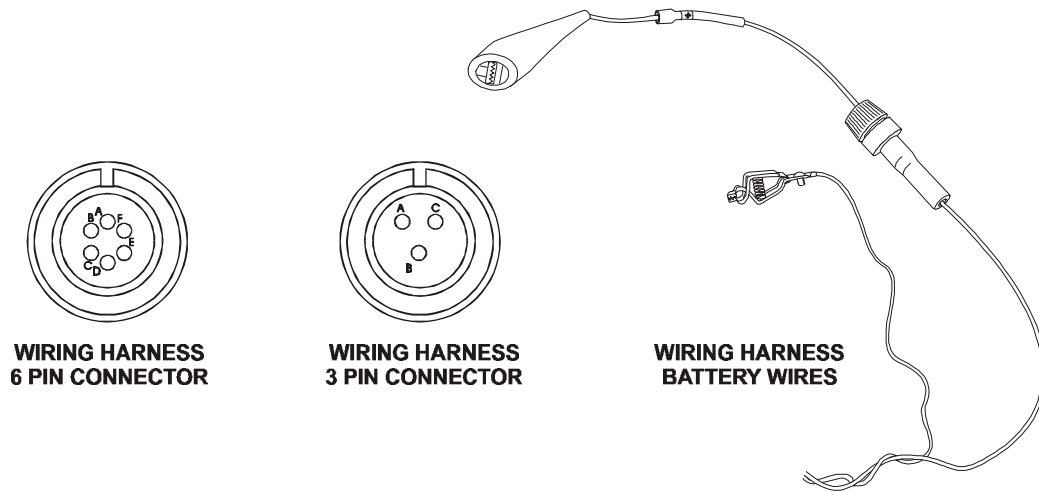
- c. Set multimeter to ohms and zero multimeter. Touch red probe on pin A of electrical receptacle connector (1) and black probe on pin C (ground). Clean pins with a rag to ensure a good reading.



If meter reads infinity on OHMS scale, no fault. Discharger has passed continuity check.

If any other reading than infinity on OHMS scale, short circuit. Replace discharger (WP 0016 00).

4. Complete troubleshooting of the wiring harness and arming firing unit as follows:
 - a. Check continuity of the wiring harness using following diagram.



NOTE

Continuity between pins can only exist as listed below in part one. System will not function if any continuity exists between pins as listed in part two.

CONTINUITY MUST EXIST BETWEEN

<u>WIRING HARNESS 6 PIN CONNECTOR</u>	<u>WIRING HARNESS 3 PIN CONNECTOR</u>	<u>WIRING HARNESS BATTERY WIRES</u>
A		WHITE
B	C	BLACK
C	A	
D (Not Used)	B (Not Used)	
E (Not Used)		
F (Not Used)		

NO CONTINUITY CAN EXIST BETWEEN

<u>WIRING HARNESS 6 PIN CONNECTOR</u>	<u>WIRING HARNESS 3 PIN CONNECTOR</u>	<u>WIRING HARNESS BATTERY WIRES</u>
A		BLACK
B		WHITE
C		WHITE
D (Not Used)	B (Not Used)	
E (Not Used)		
F (Not Used)		

DISCHARGER WON'T FIRE – Continued

- b. Check continuity of arming firing unit as follows:

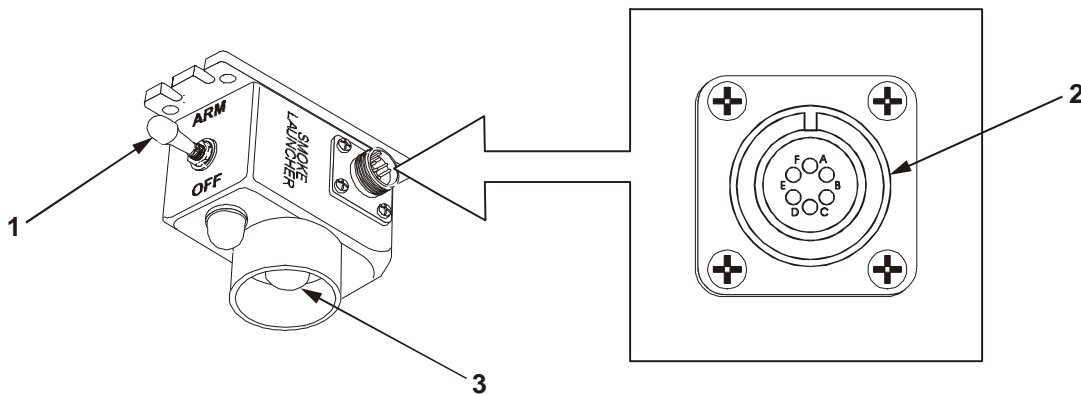
NOTE

Do not let multimeter probe touch electrical receptacle connector shell.
This will cause wrong meter reading.

Ensure good contact by multimeter probe on test point. Poor contact
will cause false meter reading.

Check key on electrical receptacle connector to locate position of pins
A through F.

- (1) Set multimeter to ohms and zero multimeter. Move ARM/OFF switch (1) to OFF. Press firing button (3) with red probe on pin A and black probe on pin C of connector (2).



If meter reads infinity on OHMS scale, no fault, go to next step.

If any other reading, faulty arming firing unit. Replace arming firing unit (WP 0017 00).

- (2) Move ARM/OFF switch (1) to ARM, with red probe on pin A and black probe on pin C of connector (2).

If meter reads infinity on OHMS scale, no fault, go to next step.

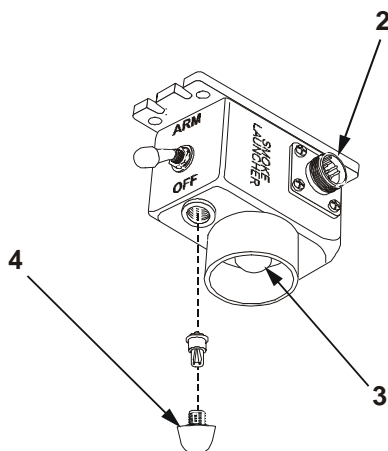
If any other reading, faulty arming firing unit. Replace arming firing unit (WP 0017 00).

- (3) Press firing button (3) with red probe on pin A and black probe on pin C of connector (2).

If meter reads zero on OHMS scale, no fault, go to next step.

If any other reading, faulty arming firing unit. Replace arming firing unit (WP 0017 00).

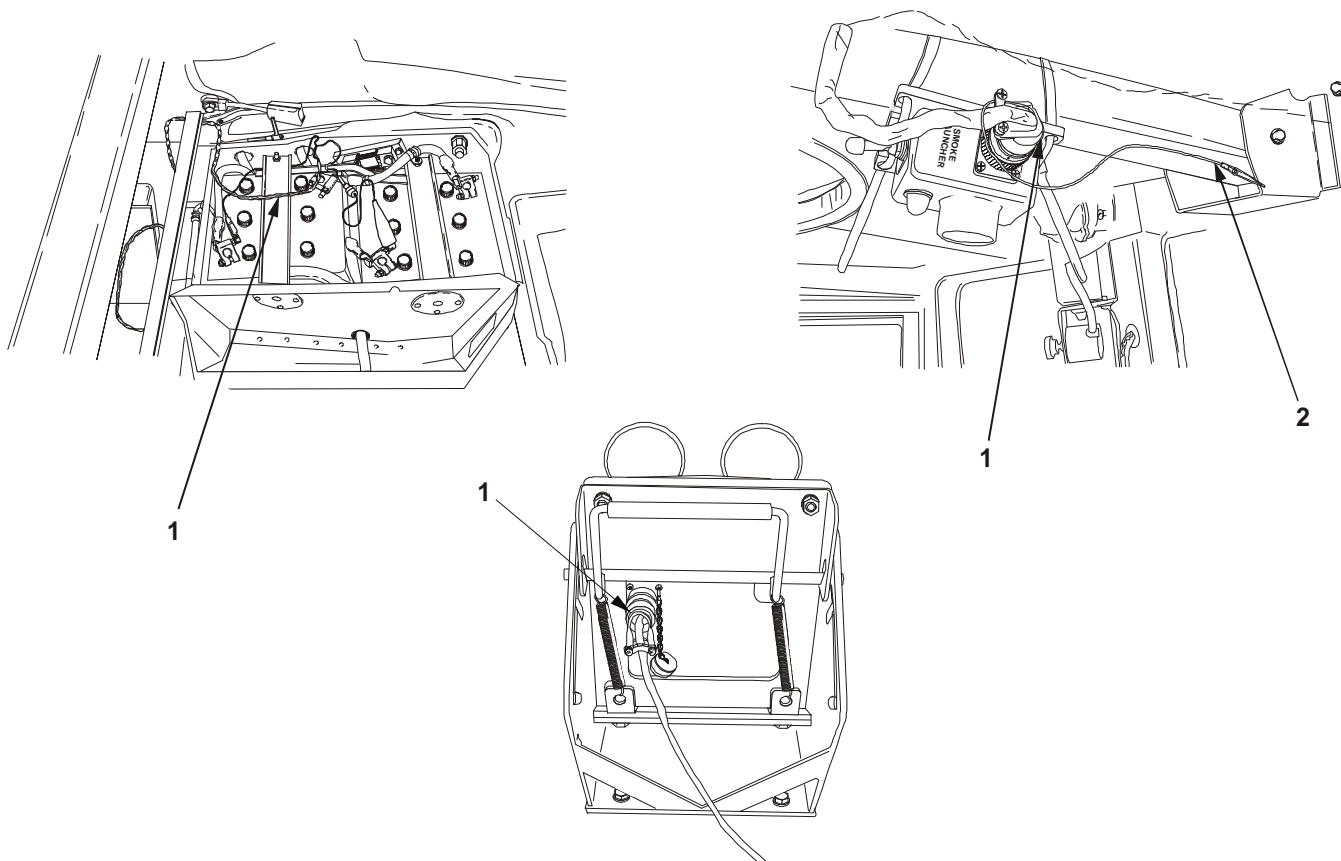
- (4) Unscrew and remove lens (4) with lamp. Press firing button (3) with red probe on pin A and black probe on pin B of connector (2).



If meter reads infinity on OHMS scale, no fault. Install same lens (4) with lamp. Arming firing unit has passed continuity check.

If any other reading, faulty arming firing unit. Replace arming firing unit (WP 0017 00).

5. Reconnect the wiring harness (1) to the batteries, arming firing unit, and discharger. Reconnect the grounding wire clip (2).



INDICATOR LAMP WON'T LIGHT**NOTE**

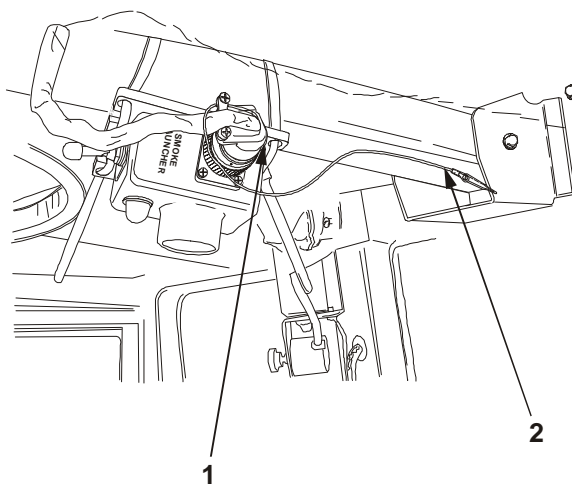
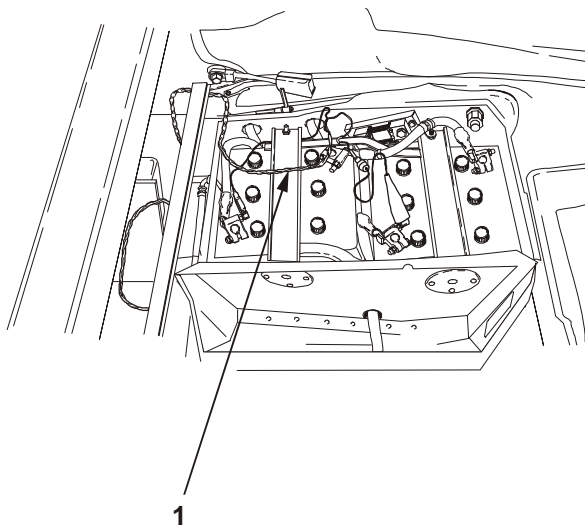
Do not let multimeter probe touch electrical receptacle connector shell. This will cause false meter reading.

Ensure good contact between multimeter probe on test point. Poor contact will cause false meter reading.

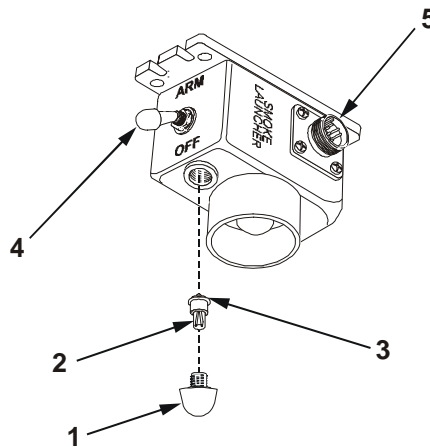
Check key on electrical receptacle connector to locate position of pins A through F.

1. Ensure that the wiring harness (1) is connected to the batteries and the arming firing unit. Ensure grounding wire clip (2) is connected. Ensure ARM/OFF switch is set to ARM.

If lamp still won't light, go to next step.



2. Unscrew and remove lens (1) with preformed packing and lamp.
3. Set multimeter to OHMS and zero the meter. Touch red probe to body of lamp (2) and black probe to tip of lamp (3).
If meter reads infinity, replace bulb (WP 0019 00).
If meter reads approximately 5 OHMS, bulb is good. Go to step 4.
4. Disconnect wiring harness from arming firing unit. Move ARM/OFF switch (4) to ARM. Touch red probe to pin A and black probe to pin B of connector (5).
If meter reads any other reading than infinity, arming firing unit is good, go to step 5.
If meter reads infinity, arming firing unit is bad. Replace arming firing unit (WP 0017 00).



5. Set multimeter to VDC. Touch red probe to female end A on arming unit cable connector. Touch black probe to ground.
If meter reads battery voltage, go to step 6.
If meter reads other than battery voltage, check the in-line fuse to be sure it is properly seated and not blown.
If fuse is properly seated and not blown, replace wiring harness (WP 0018 00).
6. Set multimeter to OHMS. Touch red probe to female end B of arming firing unit cable connector. Touch black probe to ground.
If meter reads 0 OHMS, no malfunction detected. Notify your supervisor if malfunction still exists.
If meter reads infinity, replace wiring harness (WP 0018 00).

END OF WORK PACKAGE

CHAPTER INDEX OF WORK PACKAGES

CHAPTER 5

OPERATOR MAINTENANCE INSTRUCTIONS

This chapter contains the following Work Packages:

Operator Preventive Maintenance Checks and Services (PMCS).....	0011 00
Operator Maintenance.....	0012 00
Ammunition Marking Information.....	0013 00

OPERATOR MAINTENANCE**M315 GRENADE LAUNCHER INSTALLATION KIT**

OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

INTRODUCTION

This table contains four BEFORE checks, one DURING check, and four AFTER checks. If your equipment fails any of the checks, report the deficiency to unit maintenance using DA Form 2404.

The BEFORE checks should be done immediately after the installation kit components are installed on the vehicle but before you take the vehicle on a mission.

The DURING check should be done during operation.

The AFTER checks should be done after the mission is complete but before the components are disassembled and returned to the reusable container.

PMCS PROCEDURES

Item Number Column. Numbers in this column are for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), include the item number for the check or service indicating a fault. Item numbers also appear in the order you must do checks and service for the intervals listed.

Interval Column. This column tells you when you must do the procedure in the procedure column. For this equipment there are BEFORE, DURING, and AFTER operation checks.

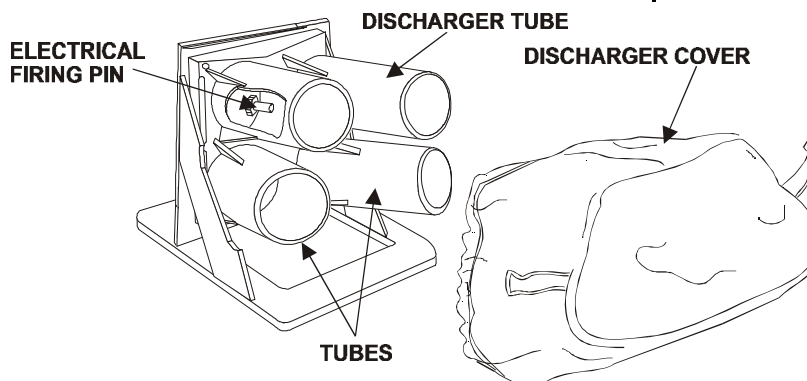
Item to Check/Service Column. This column identifies the item to be checked.

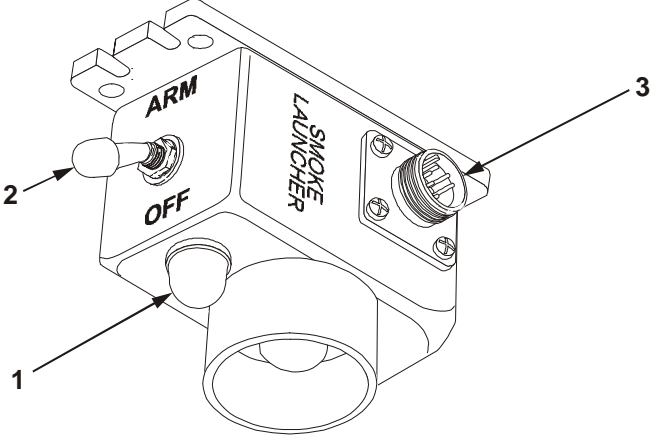
Procedure Column. This column provides the instructions for how to do the inspection.

Equipment Not Ready/Available If: Column. Information in this column tells you what faults will keep the equipment from being capable of performing its primary mission. If you find a fault listed in this column, do not operate the equipment. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

Table 1. Operator Preventive Maintenance Checks and Services for M315 Installation Kit

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Before	Discharger	<ol style="list-style-type: none"> 1. Check discharger for obvious damage. 2. Clean discharger if needed as follows: <ol style="list-style-type: none"> a. Remove any buildup of grease or dirt by wiping with a soft cloth (Item 4, WP 0034 00) and detergent (Item 3, WP 0034 00). b. Wipe dry with a soft cloth. c. Check that firing contacts are not corroded or damaged. d. Check that drain holes in bottom of tubes are open. Use pipe cleaner (Item 1, WP 0034 00.) See WP 0012 00 for detailed cleaning instructions. 3. Move the adjustable handle from 100M to 75M and 50M settings to check for ease of movement. Lubricate moving parts as needed (Item 2, WP 0034 00). 4. Ensure discharger cover is installed and serviceable. 	<p>Tubes are cracked.</p> <p>Firing contacts are obviously damaged to the point that contact with grenade is not possible.</p>



ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
2	Before	Arming Firing Unit	<ol style="list-style-type: none"> 1. Check arming firing unit for obvious damage. 2. Check that indicator light (1) comes on when ARM/OFF switch (2) is set to ARM. 	Indicator light does not come on.
3	Before	Wiring Harness	<ol style="list-style-type: none"> 3. Check electrical connector (3) for bent or missing pins. There should be three pins. 1. Trace along harness from arming firing unit to dischargers to battery and check for obvious damage. Ensure all cable connectors are tight. 2. Check for frayed wires, tears or any damage rendering the cable unserviceable. 	<p>Wires are cut.</p> <p>Obvious damage to cable.</p>
4	Before	Grenade	Ensure that the grenade body or end cap are not damaged, i.e. dents.	Damage is found to grenade body or end cap.
5	During	Discharger	Ensure all grenades fire when fire button is pressed.	One or more grenades do not launch when fire button is pressed.
6	After	All Components	Repeat the four BEFORE checks listed above.	

END OF WORK PACKAGE

OPERATOR MAINTENANCE**M315 GRENADE LAUNCHER INSTALLATION KIT**

CLEAN DISCHARGER, REPLACE AFU LAMP, AND REPLACE WIRING HARNESS FUSE

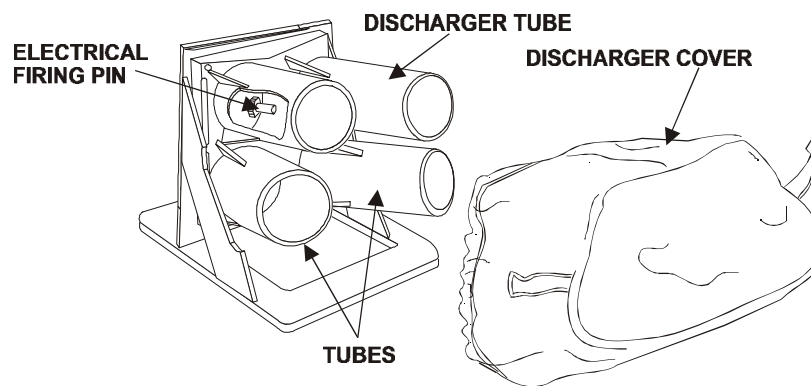
INITIAL SETUP:**Materials/Parts**

Pipe cleaner (Item 1, WP 0034 00)
Clean wiping rag (Item 4, WP 0034 00)
Detergent (Item 3, WP 0034 00)
Indicator lamp (on-board spare)
Fuse (on-board spare)

CLEAN DISCHARGER**NOTE**

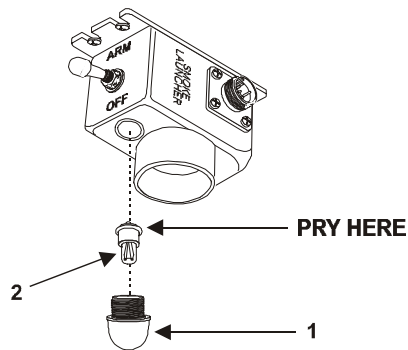
Report any damaged dischargers to unit maintenance.

1. Remove discharger cover from discharger tubes.
2. Use pipe cleaner to clean two drain holes at bottom of each tube.
3. Loosen and push out any dirt or debris from drain holes.
4. Using soapy water and a clean wiping rag, clean inside of grenade discharger tube.
5. Dry with clean wiping rag.
6. Check grenade discharger for cracked tubes.
7. Check that electrical firing pin is not corroded.
8. Check that the discharger is securely mounted to vehicle.
9. Install discharger cover on tubes.



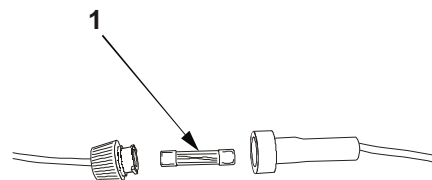
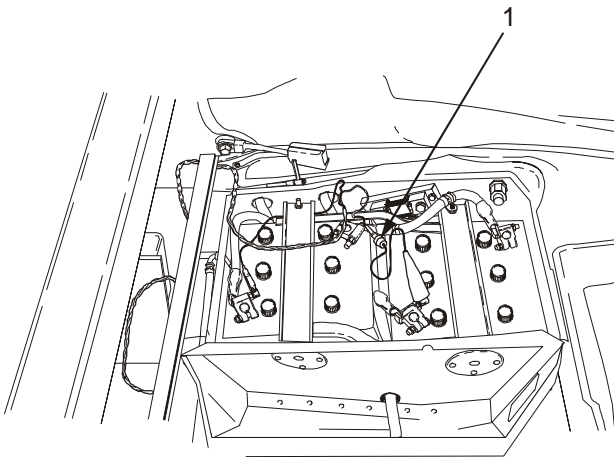
REPLACE ARMING FIRING UNIT LAMP

1. Obtain spare indicator lamp from on-board spares.
2. Unscrew and remove lens with preformed packing and lamp.
3. If socket is corroded, clean with wiping rag.
4. Check preformed packing between lens (1) and lamp (2). If cut, torn, or missing, notify unit maintenance to replace lens which includes preformed packing.
5. Pry lamp (2) from lens (1) at the point illustrated and replace.
6. If lens is cracked, notify unit maintenance to replace.
7. Install new lamp in lens.
8. Screw lens with preformed packing and lamp into socket.



REPLACE WIRING HARNESS FUSE

1. Access vehicle battery (TM 9-2320-280-10/ TM 2320-10/6B) by removing front passenger seat.
2. Remove bad fuse (1) from fuse holder by pushing in and turning 1/4 turn clockwise.
3. Install new fuse and connect protective cover by pushing in and turning 1/4 turn counterclockwise.
4. Return front passenger seat to original position.



END OF WORK PACKAGE

OPERATOR MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
AMMUNITION MARKING INFORMATION

GENERAL INFORMATION

The following grenades are authorized to be used with the adjustable grenade launcher:

- Grenade, Launcher, Smoke: Screening, TA, M90
- Grenade, Discharger, Anti-Riot, Irritant, CS, L96A1
- Grenade, Discharger, Anti-Riot, Practice, L97A1
- Grenade, Launcher: Non Lethal, Distraction, M98
- Grenade, Launcher: Non Lethal, Blunt Trauma, M99

The following pages of this Work Package provide warnings, purpose and description, and marking information for each grenade.

M90 GRENADE

WARNING

Chemical Hazard. Prolonged breathing of obscurant smoke can damage your lungs. Personnel entering a smoke cloud must wear appropriate face protection such as an M17 or M40 series protective mask.

Noise Hazard. During firing training, personnel within 1/2 meter of M90 grenades must wear single hearing protection. This includes personnel within the vehicle.

Projection Hazard. DO NOT fire grenades when personnel or equipment are within 75 meters covering a 90° arc around a firing discharger.

Projection Hazard. DO NOT fire the M90 grenade at the 50M or 75M positions on the adjustable aiming bracket. Fire only at the 100M setting.

NOTE

After grenades have fired, remove the aluminum casings from discharger tubes and reload as required by mission. See **LOADING GRENADES INTO DISCHARGERS**, WP 0006 00. During training, save aluminum casings for turn-in to local DRMO.

Purpose and Description

The M90 grenade provides a protective smoke screen for light vehicles during hostile situations. It obscures in the visual and near IR portions of the electromagnetic spectrum. It is a soft launched, non-fragmenting, low toxicity, & environmentally safe pyrotechnic smoke dispenser.

Each grenade is approximately 2.60 inches in diameter, 9.87 inches long, and weighs approximately 2.86 pounds. Each grenade has three canisters (submunitions) containing Terephthalic Acid smoke.

The canisters are propelled from the grenade outer tube when electrical current at the firing contact initiates the electric match that ignites the black powder propulsion charge. Gases from the burning propulsion charge ignite the three canisters, release the end cap of the grenade tube, and project the three canisters a distance of 35m from the host vehicle. The smoke cloud is produced by pyrotechnical dissemination of the Terephthalic Acid. The grenade outer tube remains in the discharger and must be manually removed after the canisters are ejected

Marking

The ammunition is completely identified by the markings on the outside of the casing. The thin band at the bottom is brown, the main body green, and the top is black.



L96A1 and L97A1 GRENADES**WARNING**

Chemical Hazard. CS and CA smoke can cause irritation to the eyes, mucous membranes, and skin. Personnel entering a CS or CA smoke cloud must wear appropriate face protection such as an M17 or M40 series protective mask.

Fire Hazard. The burning grenade canisters could start a fire in dry grasses. Keep fire extinguisher available.

Noise Hazard. During firing training, personnel within 16 meters must wear single hearing protection. This includes personnel within vehicle.

Projection Hazard. DO NOT fire grenades when personnel or equipment are within 150 meters covering a 90° arc around a firing discharger.

Projection Hazard. DO NOT fire these grenades at the 50M or 75M positions on the adjustable aiming bracket. Fire only at the 100M setting.

Purpose and Description

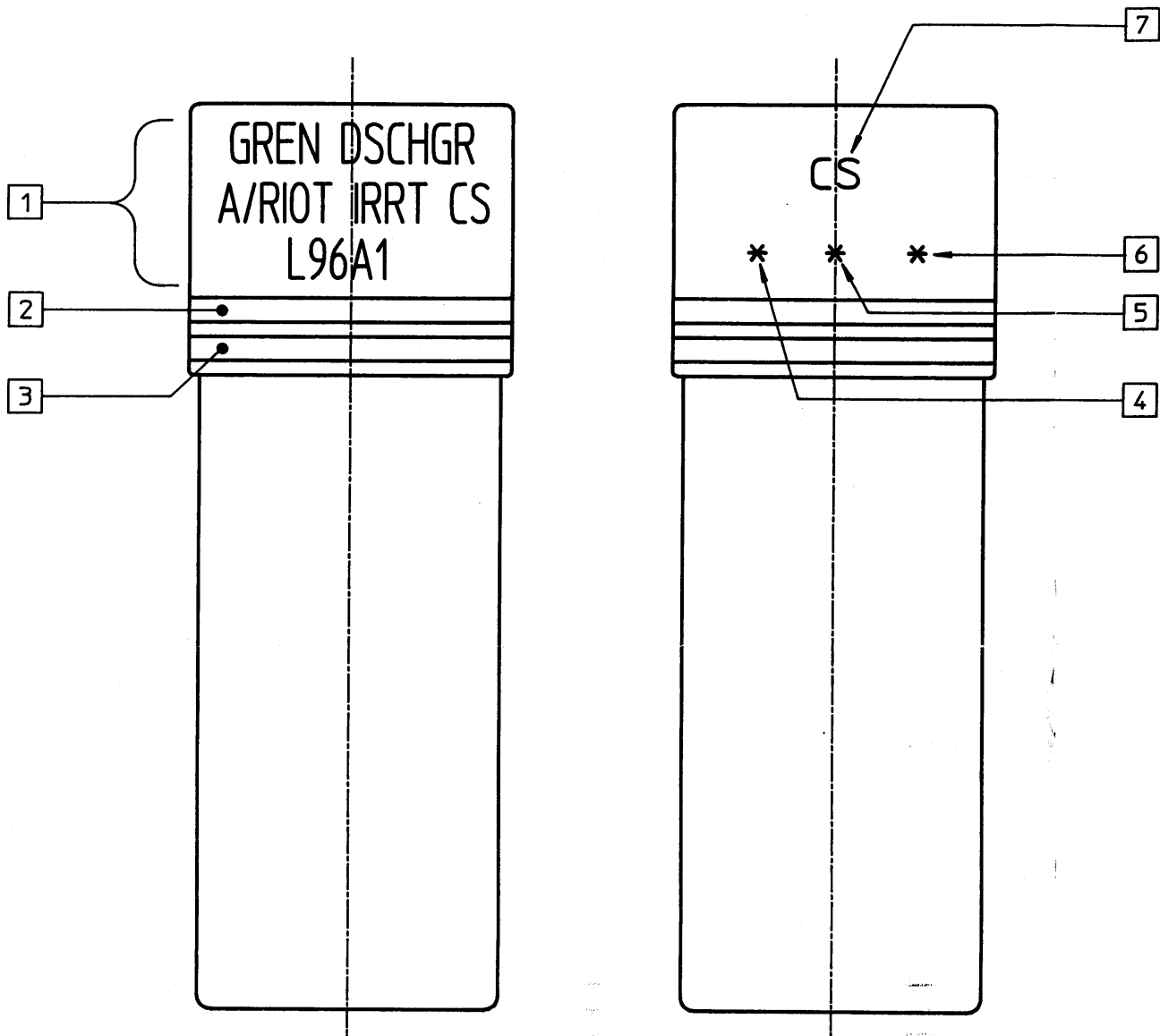
The purpose of L96A1 grenade is to help control rioting crowds by dispersing CS agent, which causes extreme irritation to the eyes and mucous membrane.

The L96A1 grenade is filled with 23 canisters containing CS compound. The grenade is 66mm in diameter (2.6 in), 185 mm (7.28 in) long, and weighs 568 gm (1.2 lb). A grenade is propelled from the discharger when electrical current at the firing contact ignites the electric match. The electric match ignites the propellant charge which ejects the grenade from the discharger. The rubber grenade body ruptures in flight to disperse the 23 canisters. The canisters produce a cloud of CS irritant smoke for approximately 10 to 12 seconds.

The L97A1 grenade has the same configuration as the L96A1. This grenade is used for training. The L97A1 contains cinnamic acid (CA) which is a CS simulant.

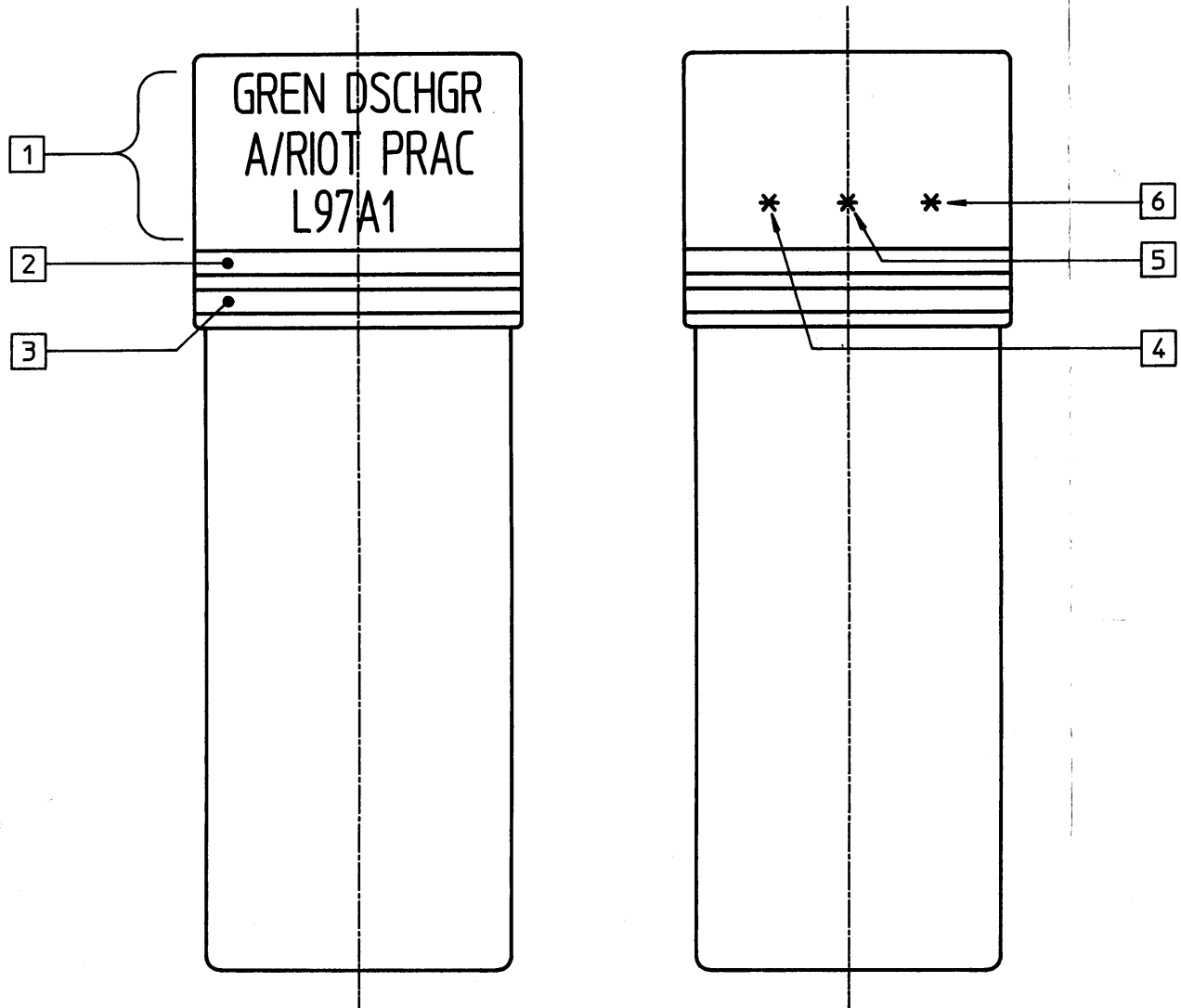
Marking

The ammunition is completely identified by the markings on the outside of the casing. Illustrations of how the grenades are marked are shown on the following two pages. The L96A1 grenade has a gray body and the L97A1 grenade has a blue body.



Legend:

1. Abbreviated name of the grenade.
2. Red band.
3. Brown band.
4. Initials of filler.
5. Date of filling.
6. Lot number.
7. Chemical content.



Legend:

1. Abbreviated name.
2. Brown band.
3. Green band.
4. Initials of filler.
5. Date of filling.
6. Lot number.

M98/99 GRENADES**WARNING**

Fire Hazard. Grenades disperse their payload by bursting. Therefore there is a remote chance of starting a fire. Keep fire extinguisher available.

Noise Hazard. During training, personnel within 17 meters of a firing launcher must wear single hearing protection. This includes personnel within vehicle.

Optical Hazard. Looking directly at a bursting grenade could result in temporary loss of vision lasting two to five minutes. Avoid looking directly at bursting grenades.

Optical Hazard. Bursting grenades may cause cornea or skin injuries at very close range. Personnel within 35 cm of an operating launcher or 1/2 meter of a bursting canister should wear safety or ballistic type eye protection, military clothing with long sleeves and elevated shirt collar, and helmet headgear.

Optical Hazard. Bursting grenades are more likely to cause eye damage to children than adults because of a child's smaller height. To minimize the risk of eye injury, the M99 grenade should be used primarily against crowds of adults.

Projection Hazard. Hazardous Electromagnetic Radiation to Ordnance (HERO) electromagnetic radiation levels of 175 MHz, 448 MHz, 503 MHz and 1430 MHz could cause the M98 and M99 grenades to fire unexpectedly. Do not handle or load these grenades within 50 meters of a frequency transmitter emitting these frequencies.

Projection Hazard. DO NOT fire grenades when personnel or equipment are within 160 meters covering a 90° arc around a firing discharger.

NOTE

After grenades have fired, remove the aluminum canisters from discharger tubes and reload as required by mission. See **LOADING GRENADES INTO DISCHARGERS**, WP 0006 00. During training, save the aluminum canisters for turn-in to local DRMO.

Purpose and Description

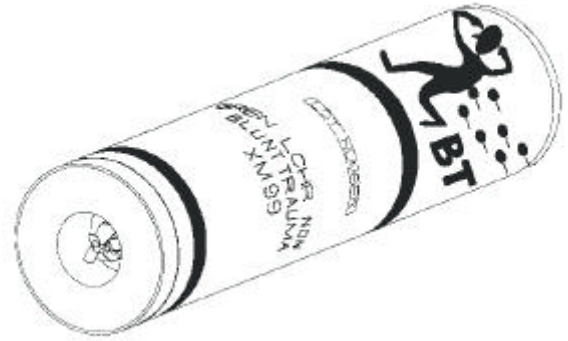
The purpose of these grenades is to help control rioting crowds by temporarily affecting their vision, disorienting them, and confusing them.

An injection-molded base contains the electrical pins that hold the grenade in the discharger and complete the electrical circuit for firing. The propulsion base has an electric match that is used to ignite a pyrotechnic propulsion charge. Immediately above the propulsion base is a pusher plate, and immediately above the pusher plate are three successive canisters. The entire content of the grenade is contained in an aluminum tube with a cap on one end and the propulsion base on the other end.

When fired from the vehicle, the grenade will deliver the audio/visual (M98) or blunt trauma (M99) payload. The M98 grenade contains a cardboard ballast material. Each canister in the M99 grenade contains 140 PVC balls (0.32 caliber).

Marking

The ammunition is completely identified by the markings on the outside of the casing. The thin band at the bottom is brown, the main body green, and the thin band above the lot number is black.



END OF WORK PACKAGE

CHAPTER INDEX OF WORK PACKAGES

CHAPTER 6

UNIT MAINTENANCE INSTRUCTIONS

This chapter contains the following Work Packages:

Service Upon Receipt	0014 00
Unit Preventive Maintenance Checks and Services (PMCS)	0015 00
Replace Discharger.....	0016 00
Replace Arming Firing Unit	0017 00
Replace Wiring Harness.....	0018 00
Replace AFU Indicator Lamp Lens	0019 00
Preparation for Storage or Shipment	0020 00

UNIT MAINTENANCE**M315 GRENADE LAUNCHER INSTALLATION KIT****SERVICE UPON RECEIPT**

GENERAL INFORMATION

Your installation kit comes in a reusable container. After inspection at the Unit level, this kit will be issued to the operator who will install the items onto the vehicle. After the mission is completed the operator will remove the components, return them to the reusable container, and return the container to Unit maintenance for storage until the next mission. One kit contains the required components for two vehicles.

CHECKING UNPACKED EQUIPMENT**WARNING**

The M315 Installation Kit weighs 175 lb. To avoid possible back injury, use four people to lift.

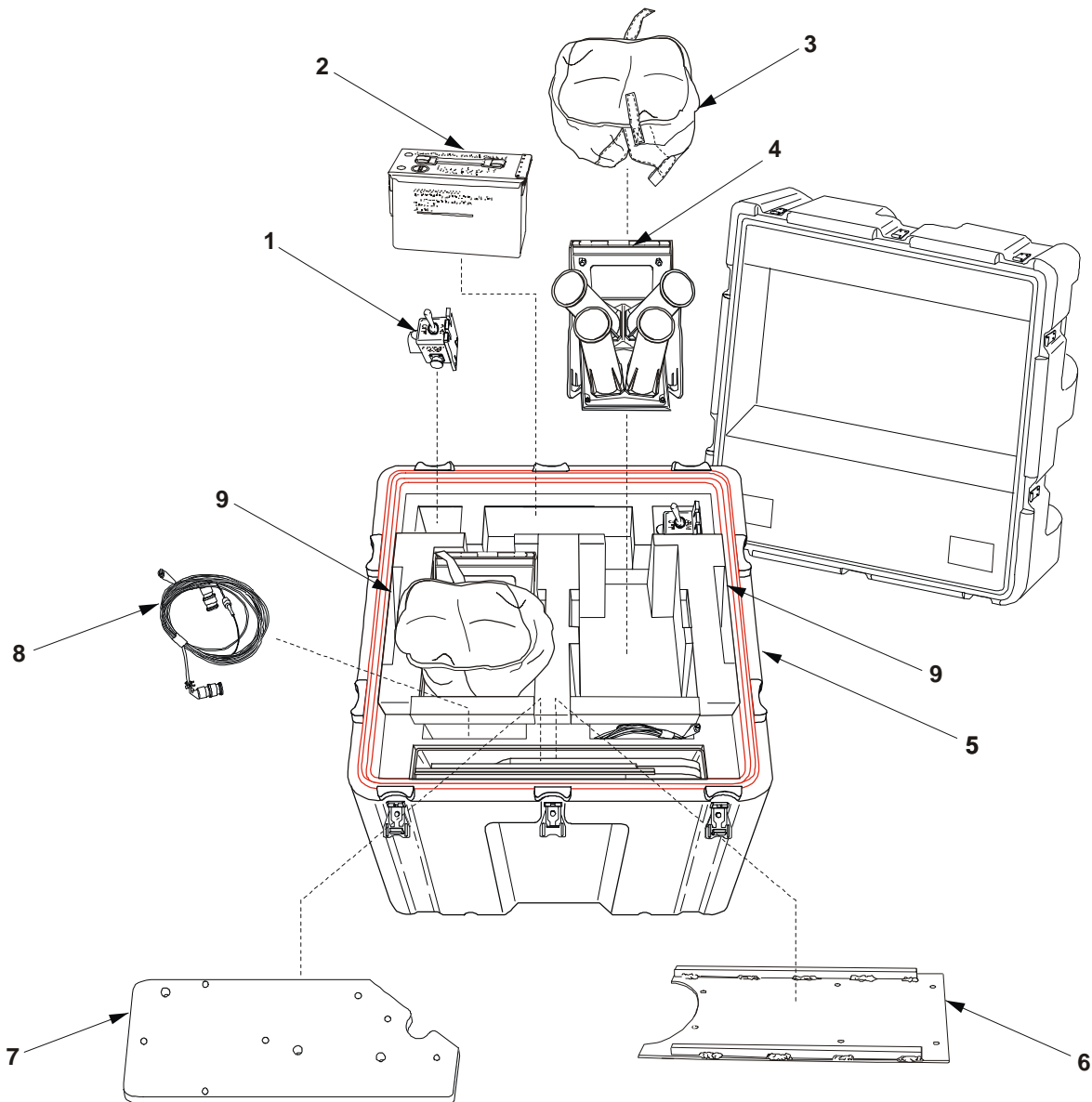
Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF 361, Transportation Discrepancy Report.

Check the equipment against the parts list on the next page to see if the shipment is complete. Report all discrepancies in accordance with:

(ARMY) Instructions in DA PAM 738-750.

(MARINE CORPS) Instructions in MCO 4855.10.

See next page for illustration of kit components.

INSTALLATION KIT COMPONENTS

1. Arming Firing Unit (2 each)
2. Assembly Parts Package (See WP 0030 00 for contents)
3. Discharger Cover (2 each)
4. Discharger Assembly (2 each)
5. Reusable Storage Container
6. Turret Mounting Bracket, TOW II Configuration (2 each)
7. Turret Mounting Bracket, Machine Gun Configuration (2 each)
8. Wiring Harness (2 each)
9. Technical Manual (2 each)

UNIT MAINTENANCE

M315 GRENADE LAUNCHER INSTALLATION KIT

UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

INTRODUCTION

This table contains one ANNUAL continuity check. If your equipment fails any of the checks, report the deficiency to your supervisor. The installation kit must be installed on a vehicle to perform this check.

PMCS PROCEDURES

Item Number Column. Numbers in this column are for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), include the item number for the check or service indicating a fault. Item numbers also appear in the order you must do checks and service for the intervals listed.

Interval Column. This column tells you when you must do the procedure in the procedure column. For this equipment there is only an ANNUAL check.

Item to Check/Service Column. This column identifies the item to be checked.

Procedure Column. This column provides the instructions for how to do the inspection.

Equipment Not Ready/Available If: Column. Information in this column tells you what faults will keep the equipment from being capable of performing its primary mission. If you find a fault listed in this column, do not operate the equipment. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

Table 1. Unit Preventive Maintenance Checks and Services for M315 Installation Kit

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Annual	Installed System	Perform the unit troubleshooting (WP 0010 00). NOTE Unit troubleshooting is a continuity check of the system using a multimeter.	Any item fails one of the checks.

END OF WORK PACKAGE

UNIT MAINTENANCE
REPLACE DISCHARGER
REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools/Materials**

Lock washers (Item 2, WP 0035 00)

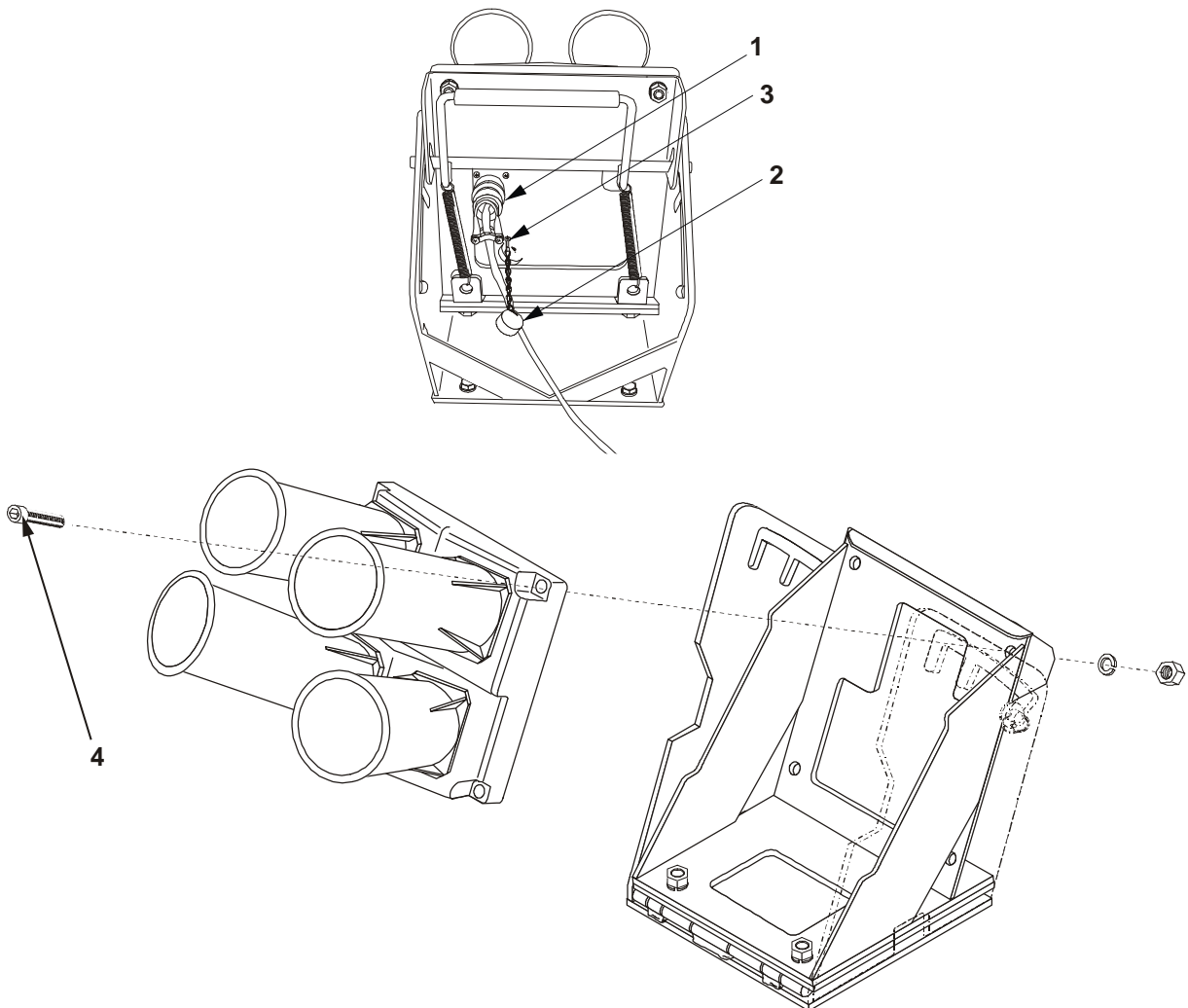
General Mechanic's Automotive Tool Kit

Equipment Condition

Grenades unloaded (WP 0006 00)

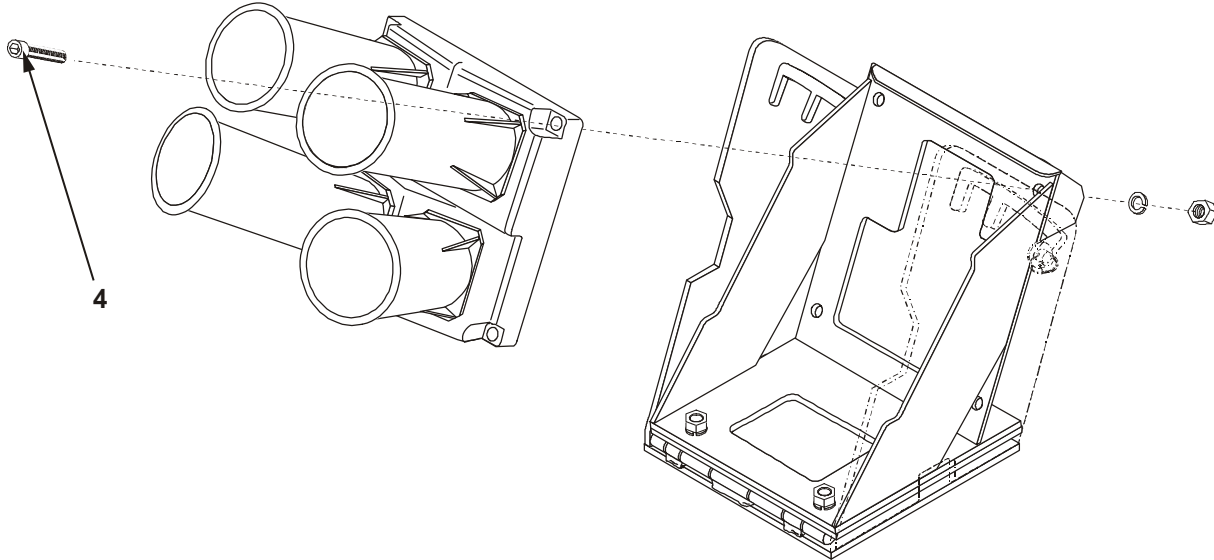
REMOVAL

1. Place handle in 50M position.
2. Remove plug connector (1) from receptacle connector on back of discharger by turning it counterclockwise and pulling.
3. Remove electrical cover (2) by removing pan head screw (3). Save both screw and cover for INSTALLATION.
4. Remove four screws (4), nuts, and lock washers using 1/2 in. open end wrench and 1/4 in. hex head wrench. Save screws and bolts; discard lock washers.
5. Remove discharger.

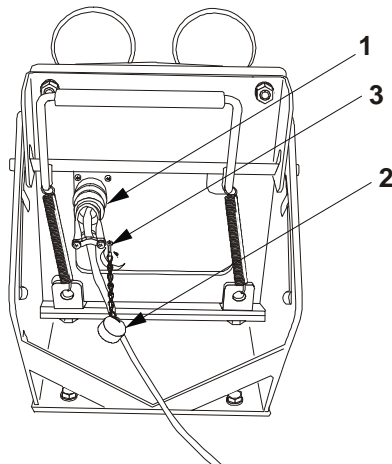


INSTALLATION

1. Position discharger over elevation bracket.
2. Install and tighten four 1 1/4 in. screws (4), nuts, and new lock washers to discharger and bracket.



3. Install plug connector to receptacle connector (1) on back of discharger.
4. Attach electrical cover (2) to back of discharger using pan head screw (3).

**END OF WORK PACKAGE**

UNIT MAINTENANCE
REPLACE ARMING FIRING UNIT
REMOVAL AND INSTALLATION

INITIAL SETUP:**Tools**

General Mechanic's Automotive Tool Kit

Equipment Condition

Grenades unloaded (WP 0006 00)

Reference

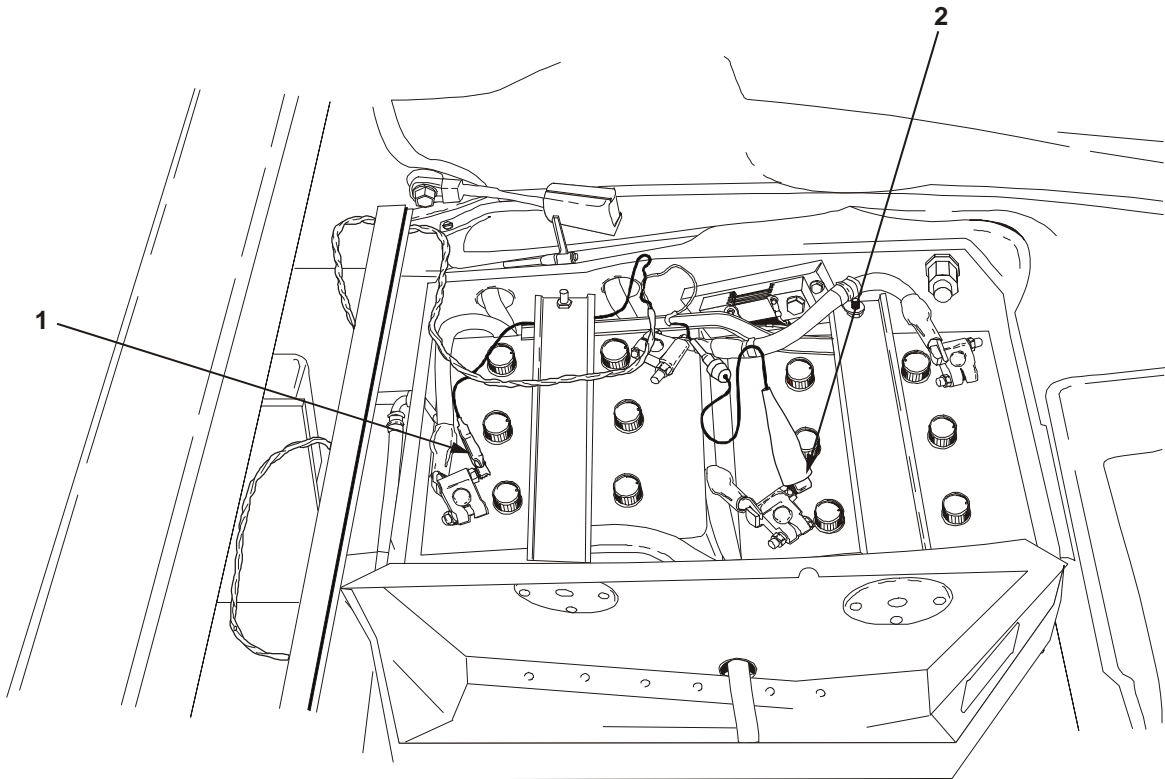
TM 9-2320-280-10/ TM 2320-10/6B

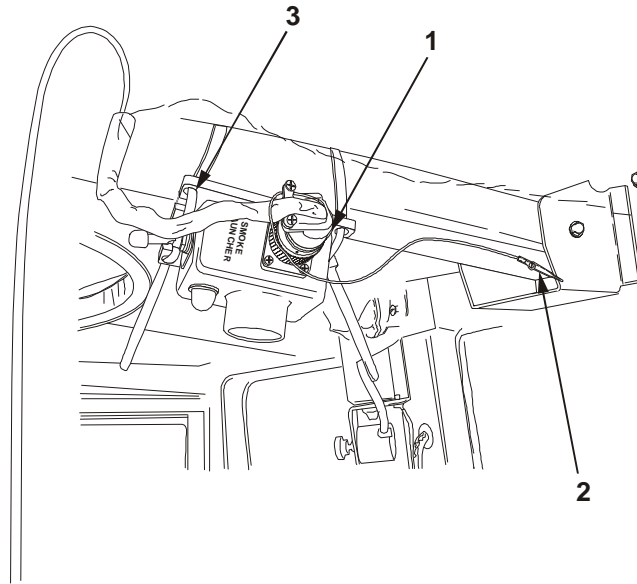
Materials/Parts

Tie down straps (Item 17, WP 0030 00)

REMOVAL

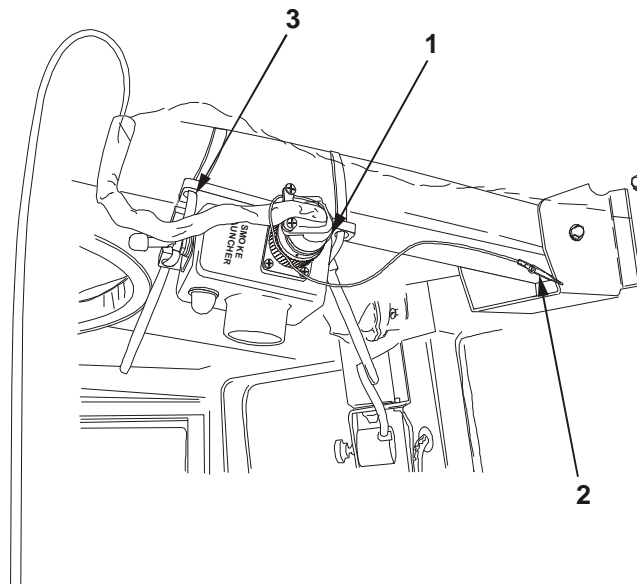
1. Disconnect wiring harness from vehicle battery as follows:
 - a. Access the vehicle's batteries located under the passenger side seat.
 - b. Disconnect black wire (1) and white wire (2) and remove wires from compartment.





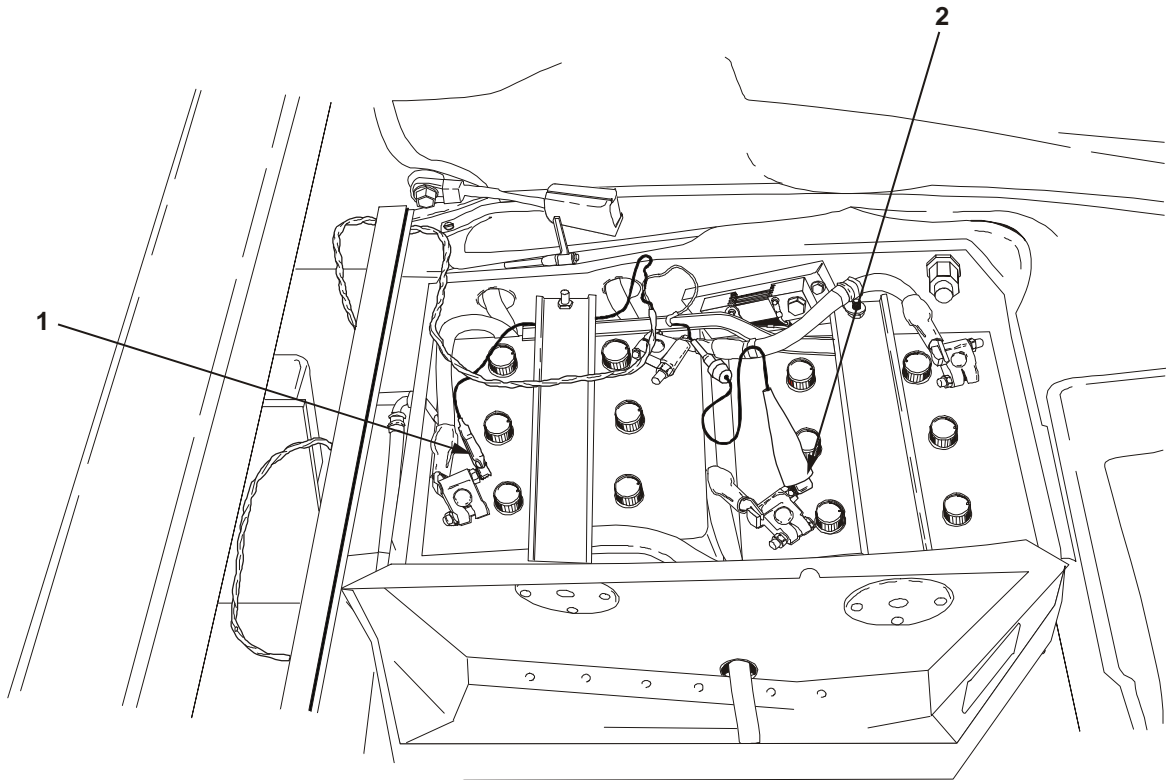
2. Remove plug connector (1) from receptacle connector on side of arming firing unit by turning it counterclockwise and pulling.
3. Disconnect ground wire (2).
4. Using needle nose pliers with cutting edge, remove the two tie-down straps (3) securing the AFU.

INSTALLATION



1. Attach the arming firing unit to the cross beam as shown using the tie down straps (3). Cut off any excess strap.
2. Ensure arming firing unit ARM/OFF switch is in OFF position.
3. Connect wiring harness connector to AFU electrical receptacle (1).
4. Anchor ground wire (2) on wiring harness to the vehicle as shown above and ensure a good contact is made for electrical ground.

5. Connect wiring harness to vehicle battery as follows:
 - a. Access the vehicle's batteries located under the passenger side seat.
 - b. Connect black wire (1) and white wire (2) and remove wires from compartment. Then return passenger seat to original position.



END OF WORK PACKAGE

UNIT MAINTENANCE
REPLACE WIRING HARNESS
REMOVAL, ASSEMBLY, AND INSTALLATION

INITIAL SETUP:**References**

TM 9-2320-280-10/TM 2320-10/6B

Equipment Condition

Grenades unloaded (WP 0006 00)

Tools

General Mechanic's Automotive Tool Kit

Crimping Tool (NSN 5120-00-278-2423

or

Crimping Tool Kit (NSN 5940-00-525-0907)

Materials/Parts

1 ea. Wiring Harness (Item 6, WP 0029 00)

2 ea. Clips (Item 1, WP 0029 00)

1 ea. Insulator (Item 3, WP 0029 00)

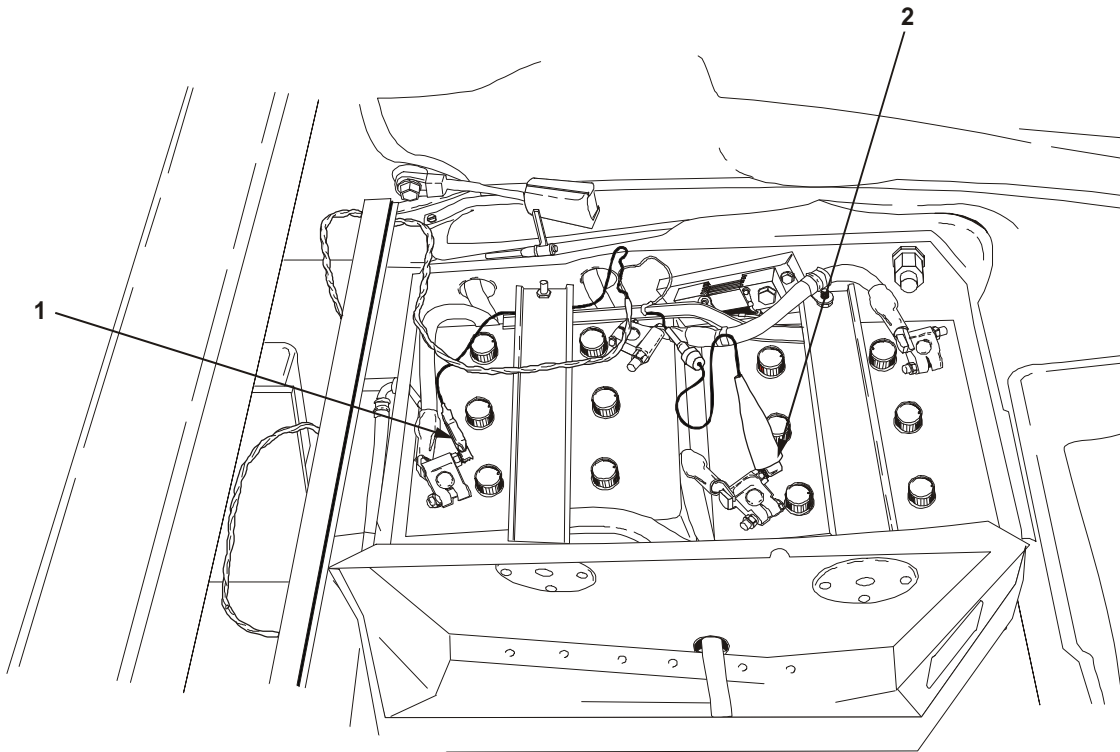
1 ea. Insulator (Item 4, WP 0029 00)

1 ea. Clip, Electrical (Item 7, WP 0029 00)

2 ea. Terminal, Ring Tongue (Item 2, WP 0029 00)

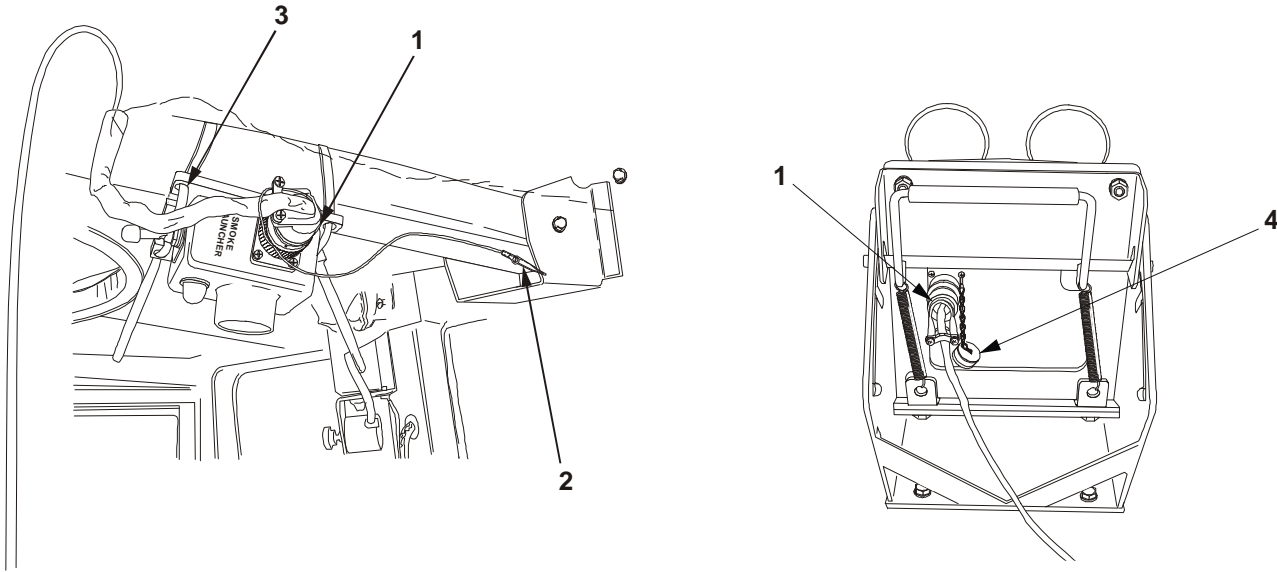
REMOVAL

1. Access the vehicle's batteries located under the passenger side seat (TM 9-2320-280-10).
2. Disconnect black wire (1) and white wire (2) and remove wires from compartment. Then return passenger seat to original position.



REMOVAL – CONTINUED

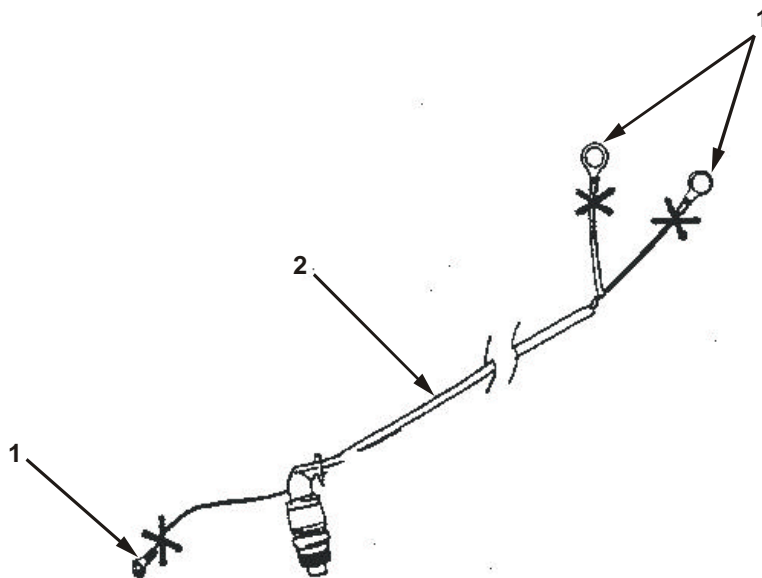
3. Remove plug connectors (1) from receptacle connector on side of arming firing unit and back of discharger by turning counterclockwise and pulling. Disconnect the ground wire (2). Connect the protective cap (4) to receptacle connector.



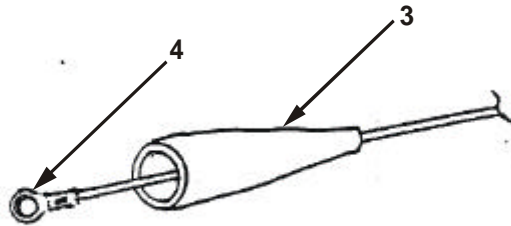
4. Trace along the entire length of the harness and detach harness from each metal clip and any overhangs. Leave the metal clips installed.
5. Remove and discard the old harness.

ASSEMBLY

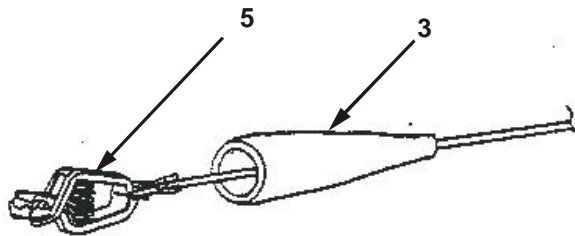
1. Obtain all the wiring harness parts listed in WP 0029 00.
2. Cut and remove the existing large ring tongue terminals (1) from wiring harness (2).



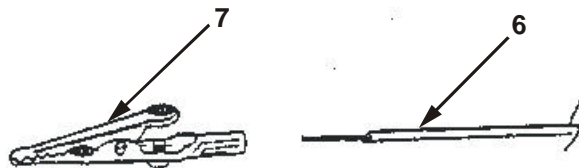
3. Slide the red insulator (3) onto the white wire with the positive marking.



4. Using the crimping tool, crimp a new ring tongue terminal (4) onto the white wire.
5. Attach the white wire with ring tongue terminal installed to the electrical clip (5) using the screw on the clip. Bend tabs on clip as appropriate. Slide the red insulator (3) onto the electrical clip.



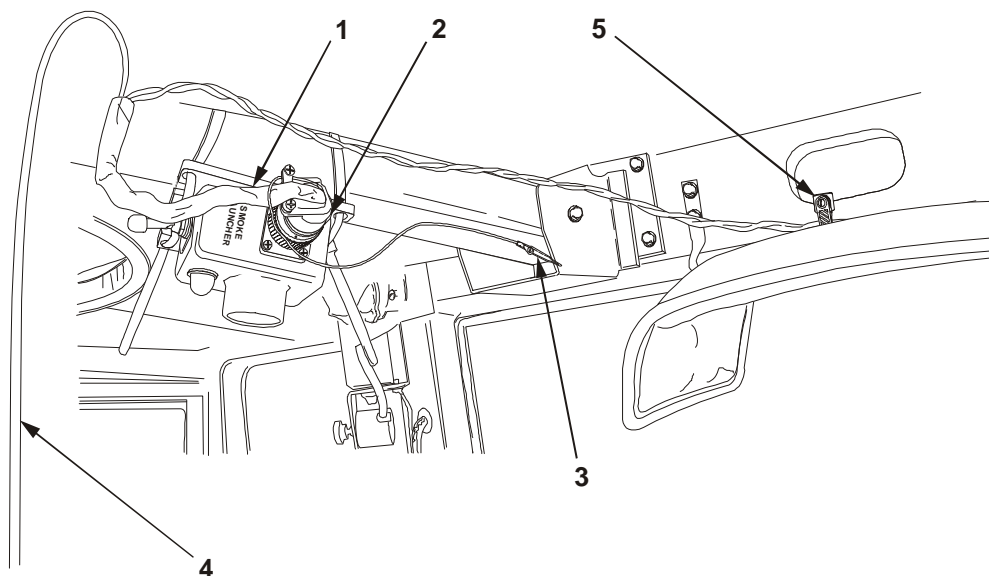
6. Slide the black insulator onto the black wire with the negative marking.
7. Using the crimping tool, crimp a new ring tongue terminal (4) onto the black wire.
8. Attach the black wire with ring tongue terminal installed to the electrical clip (5) using the screw on the clip. Bend tabs on clip as appropriate. Slide the black insulator onto the electrical clip.
9. Strip approximately 1/2 inch of insulation from the white wire marked (GND) (6).



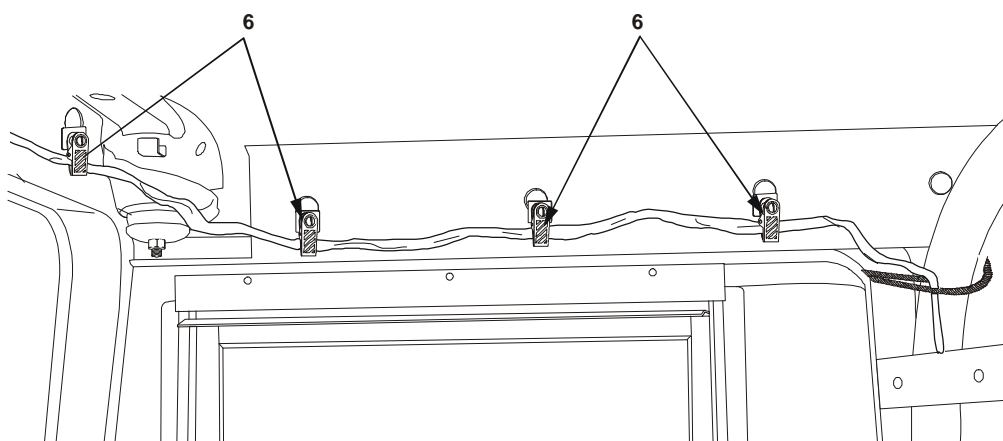
10. Slide the electrical clip (7) onto the white wire, wrap wire around securing screw, and tighten screw. Crimp the insulated portion of the wire to the terminal clip to provide additional securing of the wire.

INSTALLATION

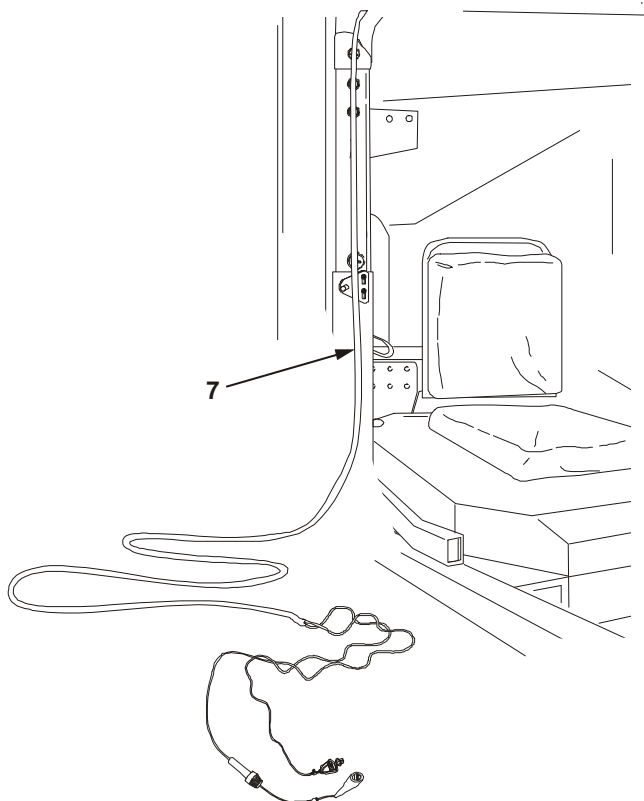
1. Separate the battery wires of the harness and locate the arming firing unit connector with six pins (1).



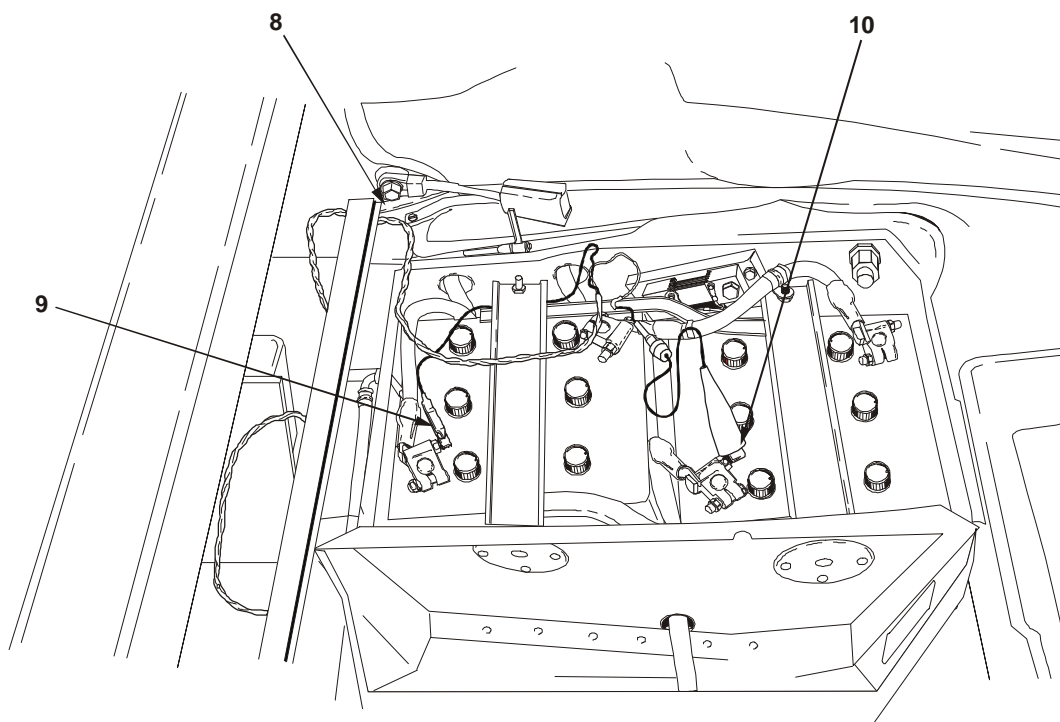
2. Connect the six-pin connector to arming firing unit electrical receptacle (2).
3. Anchor the ground wire (3) on wiring harness to the vehicle as shown above and ensure a good contact is made for electrical ground.
4. Let the three pin connector cable for the discharger (4) hang for later installation.
5. Secure the two wires, leading from the arming firing unit connector, to vehicle as shown using one metal clip (5).
6. Attach battery wires above passenger side window and corner of roof using four metal clips (6) as illustrated.



7. Allow the battery wire (7) to trace behind the vehicle side post and seat belt bracket. Keep it protected and out of the way as much as possible.



8. Access vehicle battery by removing front passenger seat and route cable through cutout (8) at rear right corner of passenger seat.



INSTALLATION - Continued

9. Connect the thin black wire (9) to negative terminal of one battery and thin white wire (10) to positive terminal of other battery as shown using clips at end of harness. Then return passenger seat to original position.

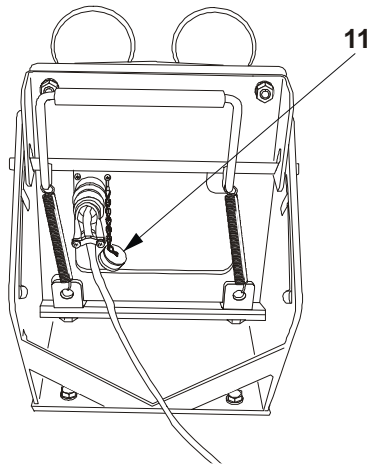
NOTE

Sometimes vehicle batteries are not installed exactly as pictured. Be sure there is 24 VDC between white and black wires.

10. Insert 3-pin end of wiring harness through turret opening and connect to rear of discharger.

NOTE

The protective cap (11) should be installed whenever the wiring harness is not connected.



11. Place the discharger cover over the discharger tubes until ready for operation.

END OF WORK PACKAGE

UNIT MAINTENANCE**REPLACE ARMING FIRING UNIT INDICATOR LAMP/LENS****REMOVAL AND INSTALLATION**

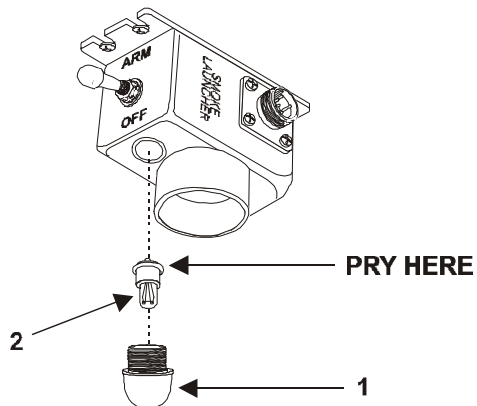
INITIAL SETUP:**Materials/Parts**

Wiping Rag (Item 3, WP 0034 00)

Equipment ConditionGrenades unloaded (WP 0006 00)

REPLACE

1. Unscrew and remove lens (1) with preformed packing and lamp (2).
2. If socket is corroded, clean with wiping rag.
3. Check preformed packing. If cut, torn, or missing, replace lens which includes preformed packing.
4. Pry lamp (2) from lens (1) at the point illustrated and replace if burned out.
5. Replace lens if cracked or if chipped.
6. Install new lamp in lens.
7. Screw lens with preformed packing and lamp into socket.

**END OF WORK PACKAGE**

UNIT MAINTENANCE**M315 GRENADE LAUNCHER INSTALLATION KIT
PREPARATION FOR STORAGE OR SHIPMENT**

SECURITY PROCEDURES

The installation kit components are nonsensitive items and may be stored or shipped, using standard storage and transportation handling procedures. Ensure grenades are removed.

PRESERVATION, PACKAGING, PACKING, MARKING, AND SHIPPING REQUIREMENTS

Prior to being installed on the vehicles, the dischargers and installation kits will be stored in their original containers.

PRESERVATION MATERIALS

No special preservation materials are required for storage or shipment of the components.

TYPE OF STORAGE

After installation the same storage instructions for the vehicle will apply to the installation kit components. The storage site should protect the equipment from the elements and allow access for visual inspection. No special storage facilities are needed.

CHAPTER INDEX OF WORK PACKAGES

CHAPTER 7

SUPPORTING INFORMATION

This chapter contains the following Work Packages:

References.....	0021 00
Maintenance Allocation Chart (MAC).....	0022 00
Repair Parts and Special Tools List (RPSTL)	
Introduction.....	0023 00
Group 00 Installation Kit, Grenade Launcher: Adjustable, Multi-purpose, 66mm, Turret Mounted, M315.....	0024 00
Group 01 Arming Firing Unit	0025 00
Group 02 Discharger Assembly.....	0026 00
Group 0201 Elevation Bracket Assembly	0027 00
Group 020101 Adjustable Elevation Bracket Assembly	0028 00
Group 03 Wiring Harness.....	0029 00
Group 04 Assembly Parts Package.....	0030 00
National Stock Number Index	0031 00
Part Number Index.....	0032 00
Components of End Item (COEI) and Basic Issue Items List	0033 00
Expendable and Durable Items List	0034 00
Mandatory Replacement Parts List.....	0035 00

OPERATOR AND UNIT MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
REFERENCES

SCOPE

This appendix lists all forms, Technical Manuals, and miscellaneous publications referenced in this manual.

MAINTENANCE FORMS

DA Form 285	Accident Report
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2028	Recommended Changes to Publications and Blank Forms
SF 361	Transportation Discrepancy Report
SF 368	Product Quality Deficiency Report
NAVMC 10772	Recommended Changes to Technical Publications
MCO 4430.3	Report of Item and Packaging Discrepancies
MCO P4610.19	Transportation and Travel Record of Transportation Discrepancies
MCO 4855.10	Product Quality Deficiency Report

TECHNICAL MANUALS

TM 9-2320-280-10/TM 2320-10/6B	Operator's Manual for High Mobility Multipurpose Wheeled Vehicle
TM 750-244-6	Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use
TM 4700-15/1	Equipment Record Procedures

MISCELLANEOUS PUBLICATIONS

AR 385-64	U.S. Army Explosives Safety Program
DA PAM 738-750	Functional User's Manual for The Army Maintenance Management System (TAMMS)
DA Pam 385-64	Ammunition And Explosives Safety Standards)
FM 21-11	First Aid for Soldiers
MCO 4790.2	Maintenance Management (MIMMS)

OPERATOR AND UNIT MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
MAINTENANCE ALLOCATION CHART (MAC)

INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

The Maintenance Allocation Chart (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels which are shown on the MAC in column (4) as:

Unit - includes two subcolumns, C (operator/crew) and O (unit) maintenance.

Direct Support - includes an F subcolumn.

General Support - includes an H subcolumn.

Depot - includes a D subcolumn.

The tools and test equipment requirements (immediately following the MAC) lists the tools and test equipment required for each maintenance function as referenced in the MAC.

The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

MAINTENANCE FUNCTIONS

Maintenance functions will be limited to and defined as follows:

Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

Service. Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

Calibrate. To determine and cause correction to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the 3rd position code of the SMR code.

Repair. The application of maintenance services including fault location/troubleshooting, removal/ installation, and disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

EXPLANATION OF COLUMNS IN THE MAC

Column (1), Group Number. Column (1) lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly.

Column (2), Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3), Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2).

Column (4), Maintenance Level. Specifies each level of maintenance authorized to perform each function listed in Column 3, by indicating work time required (expressed as man-hours in whole hours or decimals) in the appropriate subcolumns. This work-time figure represents the active time required to perform that maintenance function. The work-time figure represents the average time required to restore an item to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions.

The symbol designations for the various maintenance levels are as follows:

C	Operator or Crew
O	Unit Maintenance
F	Direct Support Maintenance
L	Specialized Repair Activity (SRA)
H	General Support Maintenance
D	Depot Maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by a work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). The code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5), Tools and Equipment. Column (5) specifies, by code, those common tool sets (not individual tools), and special tools, TMDE, and support equipment required to perform the designated function.

Column (6), Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks.

EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS

Column (1), Reference Code. The tool and test equipment reference code correlates with the code used in Column 5 of the MAC.

Column (2), Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3), Nomenclature. Name or identification of the tool or test equipment.

Column (4), National Stock Number. The National stock number of the tool or test equipment.

Column (5), Tool Number. The manufacturer's part number.

EXPLANATION OF COLUMNS IN REMARKS

Column (1), Reference Code. The code recorded in column 6 of the MAC.

Column (2), Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

Table 1. MAC for M315 Installation Kit

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
GROUP NUMBER	COMPONENT/ ASSEMBLY	MAINTENANCE FUNCTION	UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT	TOOLS AND EQUIPMENT REFERENCE CODE	REMARKS CODE
			C	O	F	H	D		
00	Installation Kit	Install	2.0					1, 4, 5	
		Inspect	.1	.1					
		Test		.3				2	
		Repair		.3				3	
		Replace		2.0				3	
01	Arming Firing Unit	Replace		.1				5	
		Repair	.1	.1					A
02	Discharger Assembly	Repair		.5				3	B
		Remove/Install	.3					1	
0201	Elevation Bracket Assembly	Repair		.1					
020101	Adjustable Elevation Bracket Assembly	Repair		.1					
03	Wiring Harness	Repair	.1	.3					C
		Replace		.2					
04	Assembly Parts Package	Repair		.1					D

Table 2. Tools and Test Equipment Requirements

(1) TOOL OR TEST EQUIPMENT REF CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL NUMBER
1	C	Box wrench, 1/2 - 9/16 in.	5120-01-349-1385	XB1618
2	O	Digital Multimeter	6625-01-265-6000	AN/PSM-45A
3	O	Tool Kit, General Mechanic's Automotive	5180-00-177-7033	SC5180-90-CL-N26
4	C	Open end wrench, 1/2 9/16 in.	5120-00-187-7124	B107.6
5	C	Needle Nose Pliers	5120-01-428-7830	196ACP

Table 3. Remarks

(1) REMARKS CODE	(2) REMARKS
A	Operator repair consists of replacing AFU lamp using on board spare. Unit repair consists of replacing the lamp lens.
B	Unit repair consists of replacing the M7 discharger.
C	Operator repair consists of replacing the wiring harness fuse using on-board spare. Unit repair consists of assembling the wiring harness.
D	Repair of the assembly parts package consists of ordering and refilling replacement tools, parts, or supplies as the package contents are used up by the operator.

END OF WORK PACKAGE

**OPERATOR AND UNIT MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL) INTRODUCTION**

SCOPE

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for performance of Unit maintenance of Installation Kit, Grenade Launcher: Adjustable, Multi-Purpose, 66mm, Turret Mounted, M315. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the source, maintenance and recoverability (SMR) codes.

GENERAL

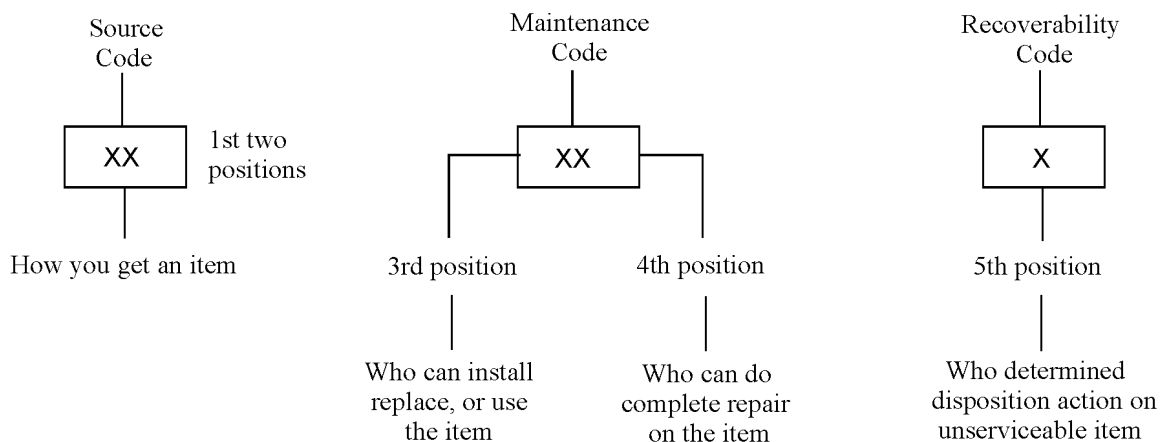
In addition to the Introduction work package, this Repair Parts and Special Tools List is divided into the following work packages.

1. **Repair Parts List Work Packages.** Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts that must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Repair parts kits are listed with their applicable figure and appear in item number sequence. Repair parts for reparable special tools are also listed. Items listed are shown on the associated illustration.
2. **Special Tools List Work Packages.** Not Applicable.
3. **Cross-reference Index Work Packages.** There are two cross-reference index work packages in this RPSTL: The National Stock Number Index and the Part Number Index. The National Stock Number Index work package refers you to the figure and item number. The Part number Index refers you to the figure and item number.

EXPLANATION OF COLUMNS IN THE RPSTL WORK PACKAGES

ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column (2)). The Source, Maintenance, and Recoverability (SMR) code contains supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout:

**NOTE**

Complete Repair: Maintenance capacity, capability and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follows:

Source Code	Application/Explanation
PA PB PC PD PE PF PG	<p>Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the 3rd position of the SMR code.</p> <p>NOTE</p> <p>Item coded PC are subject to deterioration</p>
KD KF KB	<p>Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.</p>
MO-Made at unit/ AVUM level MF-Made at DS/AVIM level MH-Made at GS level ML-Made at SRA MD-Made at Depot	<p>Items with these codes are not to be requisitioned/requested individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the bulk material group of the repair parts list of the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance.</p>
AO-Assembled by unit/AVUM level AF-Assembled by DS/AVIM level AH-Assembled by GS level AL-Assembled by SRA AD-Assembled by Depot	<p>Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.</p>

XA - Do not requisition an "XA" coded item. Order the next higher assembly. (Refer to NOTE below)

XB - If an item is not available from salvage, order it using the CAGEC and part number.

XC - Installation drawing, diagrams, instruction sheet, field service drawing; identified by manufacturer's part number.

XD - Requisition a "XD" coded item using CAGEC and part number.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR Code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following levels of maintenance.

Maintenance

Code	Application/Explanation
C	- Crew or operator maintenance done within unit/AVUM maintenance.
O	- Unit or Aviation Unit level can remove, replace, and use the item.
F	- Direct support or Aviation Intermediate level can remove, replace, and use the item.
H	- General support maintenance can remove, replace, and use the item.
L	- Specialized repair activity can remove, replace, and use the item.
D	- Depot can remove, replace, and use the item.

Fourth Position. The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i.e., perform all authorized repair functions). (NOTE: Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes). This position will contain one of the following maintenance codes.

Maintenance

Code	Application/Explanation
O	- Unit or Aviation Unit is the lowest level that can do complete repair of the item.
F	- Direct Support or Aviation Intermediate is the lowest level that can do complete repair of the item.
H	- General support is the lowest level that can do complete repair of items.
L	- Specialized repair activity (designated the specialized repair activity) is the lowest level that can do complete repair of the item.
D	- Depot is the lowest level that can do complete repair of the item.
Z	- Nonreparable. No repair is authorized.
B	- No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows:

Recoverability

Codes	Application/Explanation
Z	- Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3d position of SMR Code.
O	- Repairable item. When uneconomically repairable, condemn and dispose of the item at unit level.
F	- Repairable item. When uneconomically repairable, condemn and dispose of the item at the Direct support or Aviation Intermediate level.
H	- Repairable item. When uneconomically repairable, condemn and dispose of the item at the General Support level.
D	- Repairable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L	- Repairable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A	- Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

NSN (Column (3)). The National Stock Number for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a 5-digit code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the part listed.

DESCRIPTION AND USABLE ON CODE (Column (6)). This column includes the following information:

1. The Federal item name and, when required, a minimum description to identify the item.
2. The statement END OF FIGURE appears just below the last item description in column 6 for a given figure.

QTY (Column (7)). The QTY (quantity per figure column) indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, sub-function group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that the quantity is variable and the quantity may vary from application to application.

EXPLANATION OF PART NUMBER INDEX FORMAT AND COLUMNS

1. National Stock Number (NSN) Index Work Package.

STOCK NUMBER Column. This column lists the NSN in National Item Identification Number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN.

NSN
 (e.g., 5385-01-574-1476)
 NIIN

When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

FIG Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts list and special tools list work packages.

ITEM Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

2. Part Number (P/N) Index Work Package. Part numbers in this index are listed by part number in ascending alphanumeric sequence (i.e., vertical arrangement of number and letter combination which places the first digit of each group in order numbers 0 through 9, followed by the letters A through Z and each following digit or letter in like order).

PART NUMBER Column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

FIG. Column. This column lists the number of the figure where the item is identified/located.

ITEM Column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

SPECIAL INFORMATION

Not applicable.

HOW TO LOCATE REPAIR PARTS

1. When NSNs or Part Numbers Are Not Known.

First. Using the table of contents, determine the assembly or subassembly to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the figure covering the functional group or subfunctional group to which the item belongs.

Third. Identify the item on the figure and note the number.

Fourth. Look in the repair parts list for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. When NSN Is Known.

First. If you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

3. When Part Number Is Known

First. If you have the P/N and not the NSN, look in the PART NUMBER column of the P/N index work package. Identify the figure and item number.

Second. Look up the item on the figure in the applicable repair parts list work package.

**OPERATOR AND UNIT MAINTENANCE
GROUP 00 - M315 GRENADE LAUNCHER INSTALLATION KIT
REPAIR PARTS LIST**

The illustration for this group is on page 2 and the tabular list is on page 3.

GROUP 00 - M315 GRENADE LAUNCHER INSTALLATION KIT – Continued

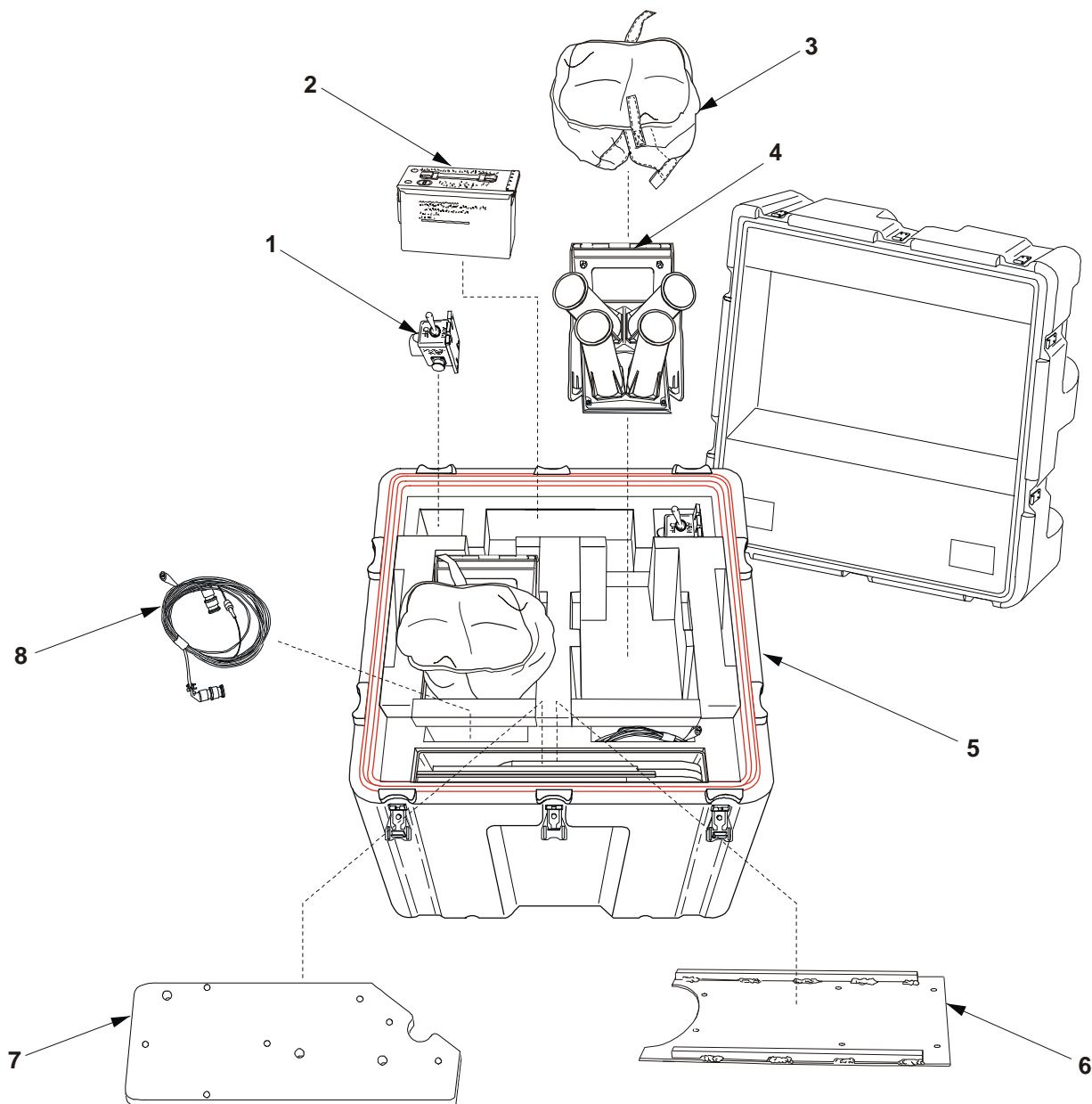


Figure 1. M315 Installation Kit, PN 13-12-1100

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					GROUP 00	
					FIG 1 M315 INSTALLATION KIT, PN 13-12-1100	
1	PAOOO	1095-01-450-2798	81361	13-12-1035	ARMING FIRING UNIT	2
2	XDOOO		81361	13-12-1134	ASSEMBLY PARTS PACKAGE	1
3	PAOZZ	2540-01-456-9071	81361	13-12-1014	COVER, CANVAS.....	2
4	XDOOO		81361	13-12-1120	DISCHARGER ASSEMBLY	2
5	XDOZZ		81361	13-12-1121	CONTAINER ASSEMBLY	1
6	XDOZZ		81361	13-12-1116	MOUNTING BRACKET (TOW II CONFIGURATION).....	2
7	XDOZZ		81361	13-12-1114	MOUNTING BRACKET (MACHINE GUN CONFIGURATION).....	2
8	AOOOO		81361	13-12-1135	WIRING HARNESS BRANCH.....	2

END OF FIGURE

**OPERATOR AND UNIT MAINTENANCE
GROUP 01 – ARMING FIRING UNIT
REPAIR PARTS LIST**

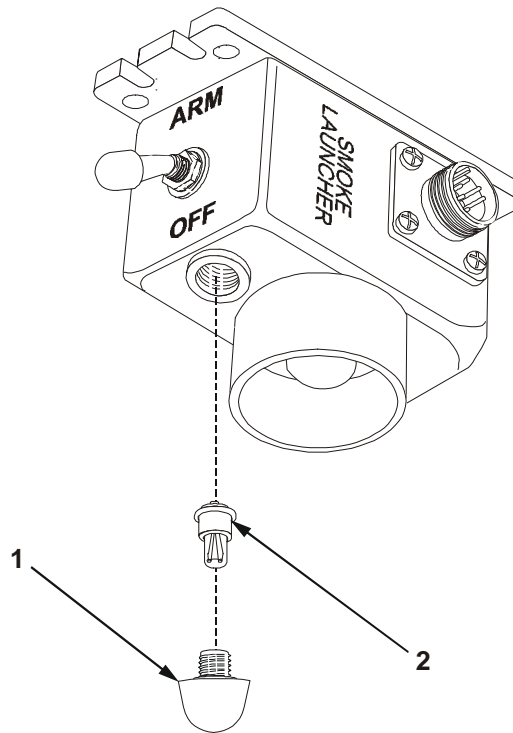


Figure 2. Arming Firing Unit, PN 13-12-1035

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
GROUP 01						
FIG 2 ARMING FIRING UNIT, PN 13-12-1035						
1	PAOZZ	6210-00-176-4955	81349	LC35GT2	LENS,LIGHT.....	1
2	PACZZ	6240-01-450-4886	81349	M6363/8-5	LAMP,INCANDESCENT.....	1

END OF FIGURE

**OPERATOR AND UNIT MAINTENANCE
GROUP 02 – DISCHARGER ASSEMBLY
REPAIR PARTS LIST**

The illustration for this group is on page 2 and the tabular list is on page 3.

GROUP 02 – DISCHARGER ASSEMBLY – Continued

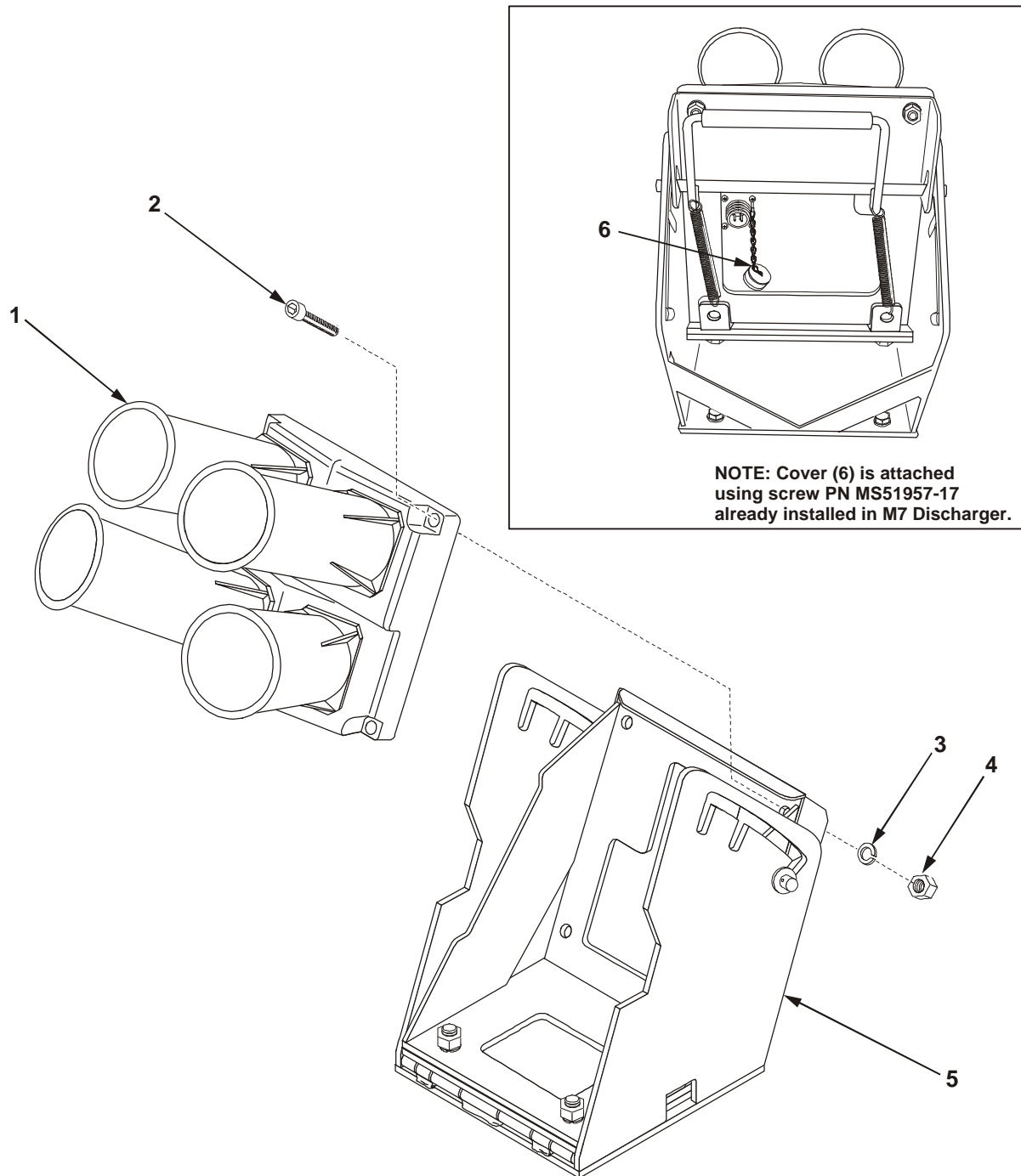


Figure 3. Discharger Assembly, PN 13-12-1120

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					GROUP 02	
					FIG 3 DISCHARGER ASSEMBLY, PN 13-12-1120	
1	PAOZZ	1040-01-454-1625	81361	13-12-1001	DISCHARGER, GRENADE, SMOKE: M7	1
2	PAOZZ	5305-00-988-7841	96906	MS16995-67	SCREW, CAP, SOCKET HEAD	4
3	PACZZ	5310-01-338-7338	96906	MS35338-45	WASHER LOCK.....	4
4	PACZZ	5310-00-931-8167	96906	MS51967-6	NUT, PLAIN.....	4
5	XDOZZ		81361	13-12-1127	ELEVATION BRACKET ASSEMBLY	1
6	PAOZZ	5935-01-181-6651	96906	MS25043-14D	COVER, ELECTRICAL CONNECTOR	1

END OF FIGURE

**OPERATOR AND UNIT MAINTENANCE
GROUP 0201 – ELEVATION BRACKET ASSEMBLY
REPAIR PARTS LIST**

The illustration for this group is on page 2 and the tabular list is on page 3.

GROUP 0201 – ELEVATION BRACKET ASSEMBLY – Continued

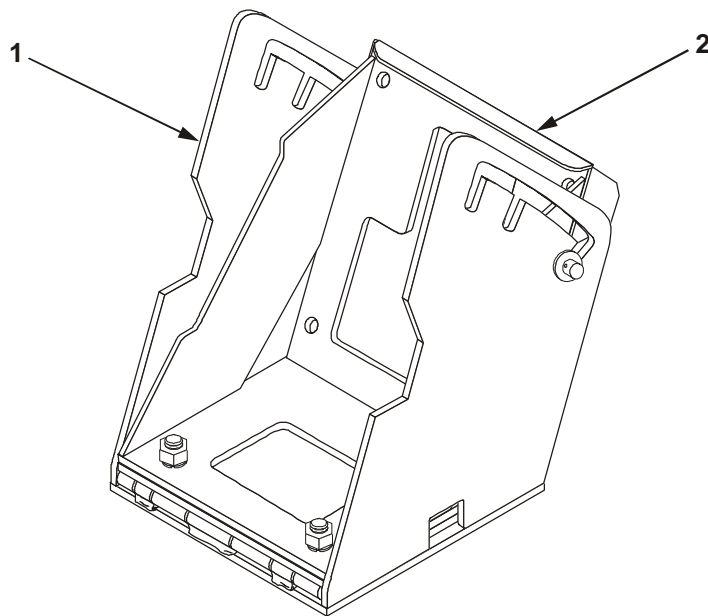
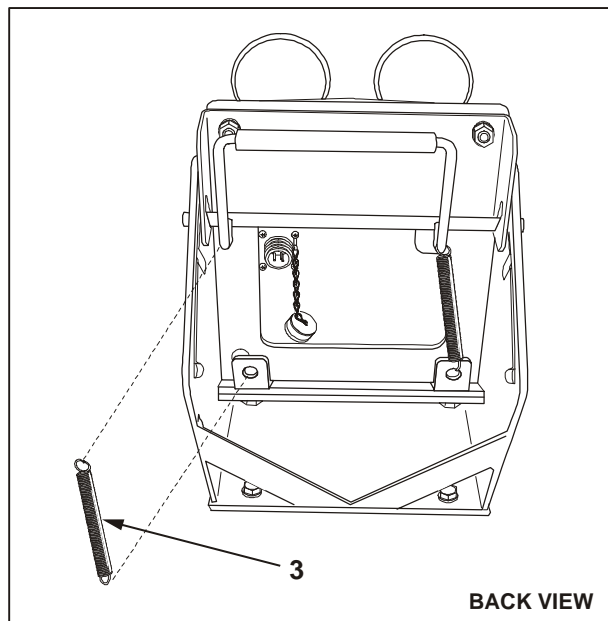


Figure 4. Elevation Bracket Assembly, PN 13-12-1127

(1)	(2)	(3)	(4)	(5)	(6)	(7)
ITEM NO.	SMR CODE	NSN	CAGEC	PART NUMBER	DESCRIPTION	QTY
					GROUP 0201	
					FIG 4 ELEVATION BRACKET ASSEMBLY, PN 13-12-1127	
1	XDOOO		81361	13-12-1125	ADJUSTABLE ELEVATION BRACKET ASSEMBLY.....	1
2	XDOZZ		81361	13-12-1005	ELEVATION BRACKET	1
3	XDOZZ		39428	9654K296	SPRING	2

END OF FIGURE

**OPERATOR AND UNIT MAINTENANCE
GROUP 020101 – ADJUSTABLE ELEVATION BRACKET ASSEMBLY
REPAIR PARTS LIST**

The illustration for this group is on page 2 and the tabular list is on page 3.

GROUP 020101 – ADJUSTABLE ELEVATION BRACKET ASSEMBLY – Continued

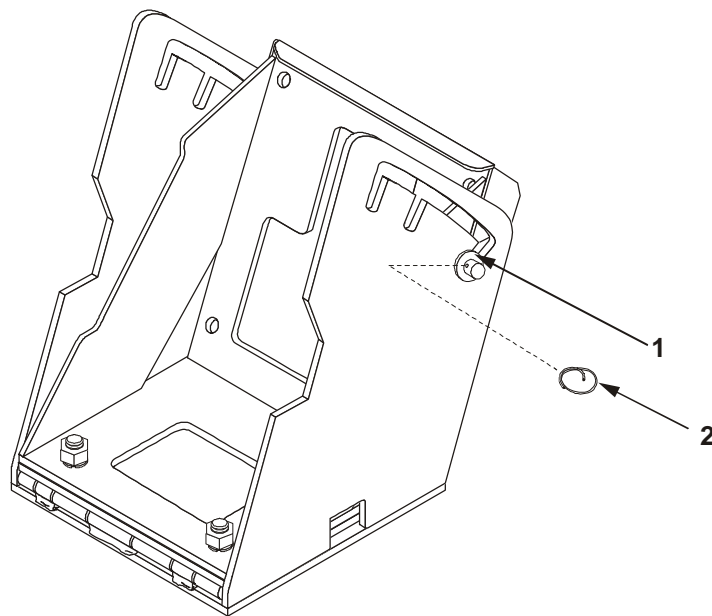
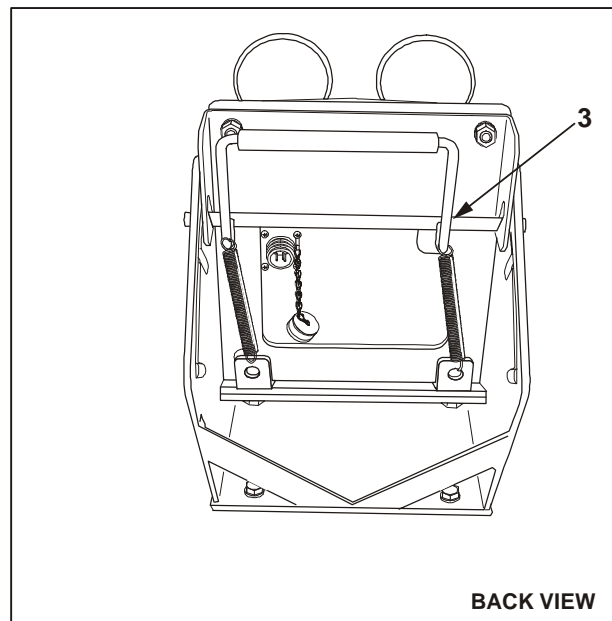


Figure 5. Adjustable Elevation Bracket Assembly, PN 13-12-1125

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					GROUP 020101	
					FIG 5 ADJUSTABLE ELEVATION BRACKET ASSEMBLY, PN 13-12-1125	
1	PAOZZ	5310-01-396-0977	80205	NAS1149F06 32P	WAHSER, FLAT, 3/8.....	2
2	XDOZZ		39428	95390A318	CIRCLE COTTER	2
3	XDOZZ		81361	13-12-1110	HANDLE ASSEMBLY.....	1

END OF FIGURE

**OPERATOR AND UNIT MAINTENANCE
GROUP 03 – WIRING HARNESS BRANCH
REPAIR PARTS LIST**

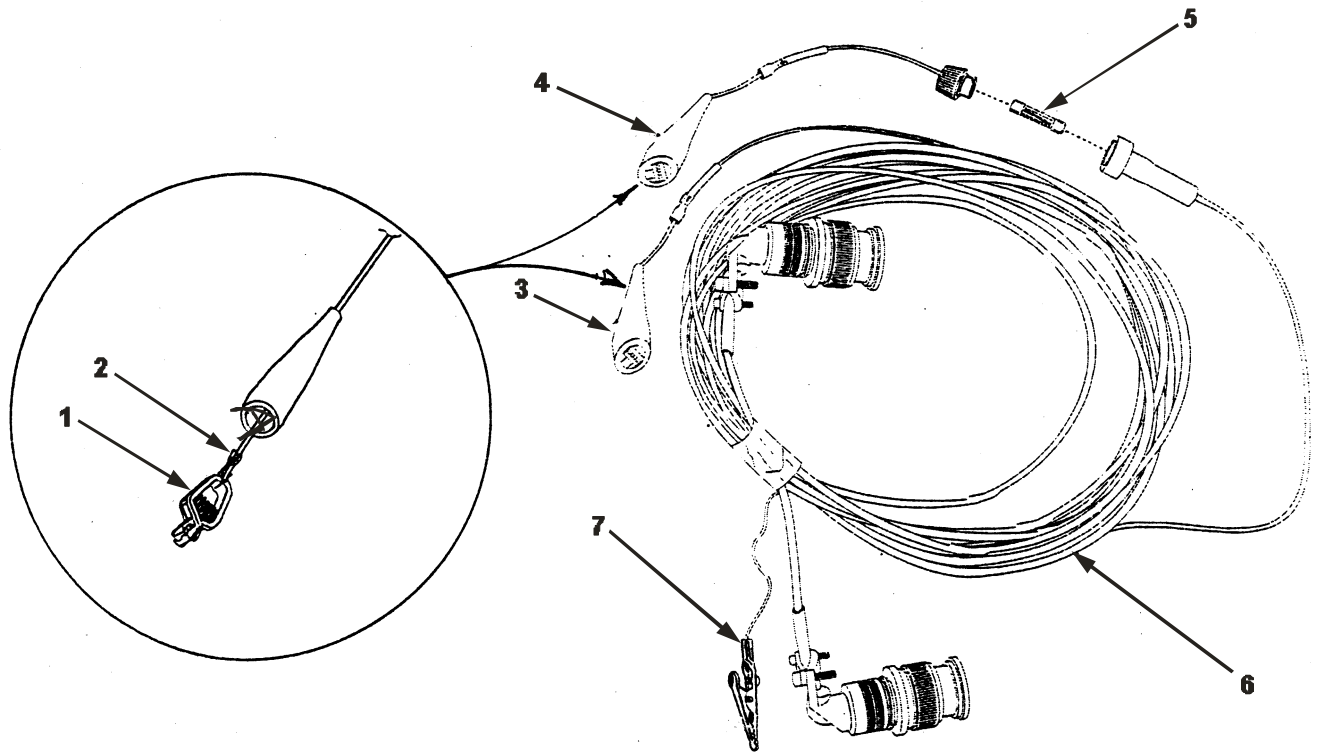


Figure 6. Wiring Harness Branch, PN 13-12-1135

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
GROUP 03						
FIG 6 WIRING HARNESS BRANCH, PN 13-12-1135						
1	PAOZZ	5999-00-230-1212	76545	BU-48C	CLIP, ELECTRICAL, 2.0 LENGTH COPPER.....	2
2	PAOZZ	5940-00-283-5280		MS25036-106	TERMINAL, RING TONGUE	2
3	XDOZZ		76545	BU-49-0	INSULATOR, BLACK.....	1
4	PAOZZ	5975-00-281-0046	76545	BU-49-2	INSULATOR, RED	1
5	PACZZ	5920-01-470-5001	71400	SFE-20	FUSE, 20 AMP	1
6	PAOZZ	6150-01-453-9284	81361	13-12-1034	WIRING HARNESS ASSEMBLY.....	1
7	PAOZZ	5999-00-195-9699	76545	BU-60	CLIP, ELECTRICAL, 2.0 LENGTH, STEEL.....	1

END OF FIGURE

**OPERATOR AND UNIT MAINTENANCE
GROUP 04 – ASSEMBLY PARTS PACKAGE
REPAIR PARTS LIST**

The illustration for this group is on page 2 and the tabular list is on page 3.

GROUP 04 – ASSEMBLY PARTS PACKAGE - Continued

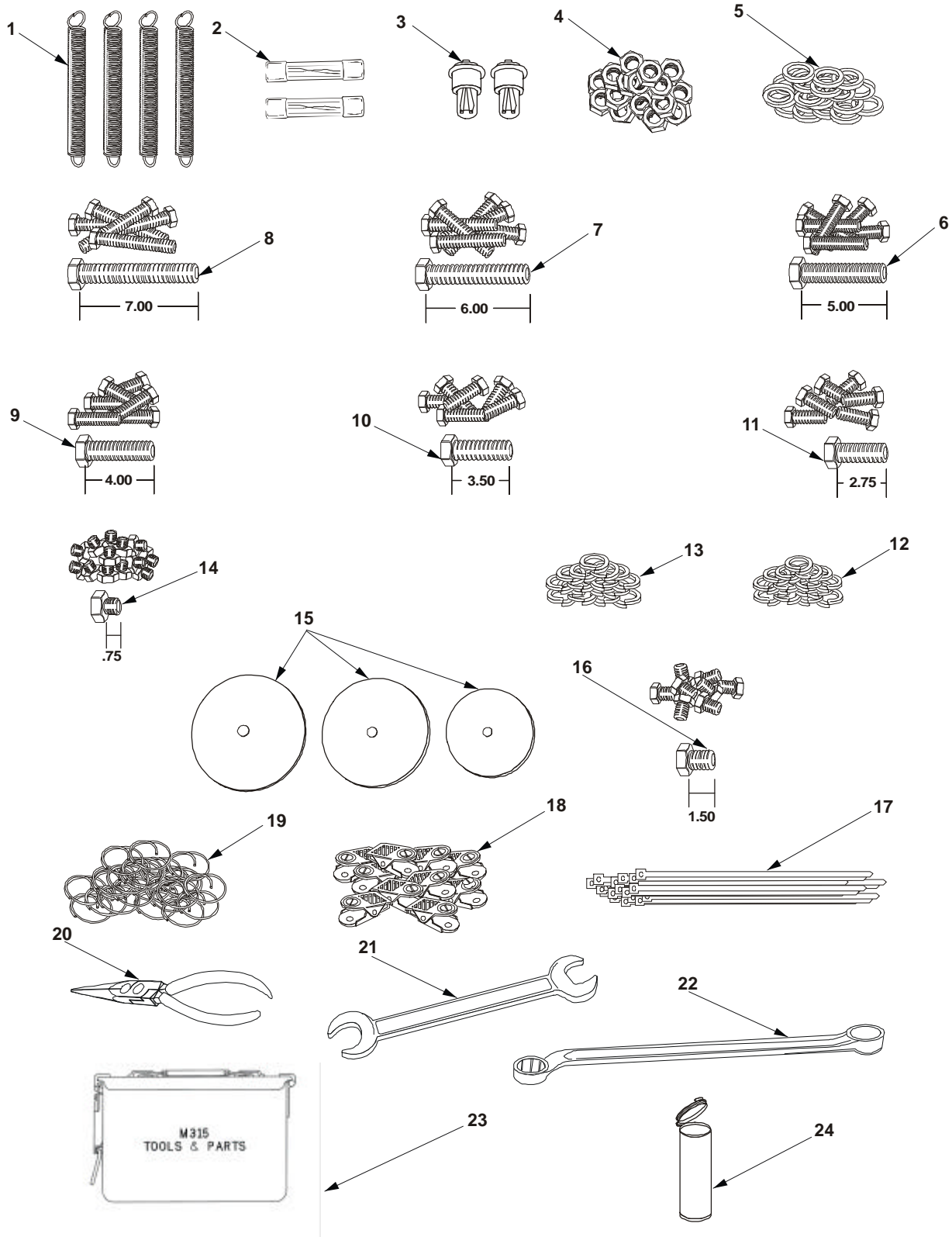


Figure 7. Assembly Parts Package, PN 13-12-1134

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					GROUP 04	
					FIG 7 ASSEMBLY PARTS PACKAGE, PN 13-12-1134	
1	XDOZZ		39428	9654K296	SPRING.....	4
2	PACZZ	5920-01-470-5001	71400	SFE-20	FUSE, 20 AMP	2
3	PACZZ	6240-01-450-4886	81349	M6363/8-5	LAMP, INCANDESCENT	2
4	XDOZZ		81349	M45913/1- 6CG8	NUT, LOCK, 3/8-16NC.....	15
5	PAOZZ	5310-01-396-0977	80205	NAS1149F06 32P	WASHER, FLAT, 3/8.....	30
6	PAOZZ	5305-01-964-0503	80204	B1821BH038 C500N	SCREW, CAP, 3/8-16NC X 5.0.....	6
7	PAOZZ	5305-01-386-9052	80204	B1821BH038 C600N	SCREW, CAP, 3/8-16NC X 6.0.....	6
8	PAOZZ	5305-01-475-3154	80204	B1821BH038 C700N	SCREW, CAP, 3/8-16NC X 7.0.....	6
9	PAOZZ	5305-00-781-3928	80204	B1821BH038 C400N	SCREW, CAP, 3/8-16NC X 4.0.....	6
10	PAOZZ	5305-00-781-3927	80204	B1821BH038 C350N	SCREW, CAP, 3/8-16NC X 3.5.....	6
11	PAOZZ	5305-00-781-3926	80204	B1821BH038 C275N	SCREW, CAP, 3/8-16NC X 2.75.....	6
12	PAOZZ	5310-01-315-3803	96906	MS35338-46	WASHER, LOCK 3/8.....	18
13	PAOZZ	5310-00-407-9566	96906	MS35338-45	WASHER, LOCK 5/16.....	18
14	PAOZZ	5306-00-050-1238	80204	B1821BH031 F075N	SCREW, CAP 5/16-24NF X .75.....	13
15	XDOZZ		81361	13-12-1115	RETAINING DISK SET	2
16	PAOZZ	5305-00-269-3240	80204	B1821BH038 F150N	SCREW, CAP, 3/8 X 1.5	8
17	PAOZZ	5975-00-985-6630	96906	MS3367-3	STRAP, TIEDOWN.....	20
18	XDOZZ			1120-1105	METAL CLIPS	10
19	XDOZZ		39428	95390A318	CIRCLE COTTERS.....	8
20	PAOZZ	5120-01-428-7830	55719	196ACP	PLIERS, NEEDLE NOSE, W/SIDE CUTTERS.....	1
21	PAOZZ	5120-00-187-7124	80204	B107.6	WRENCH, OPEN END, 1/2 X 9/16.....	1
22	PAOZZ	5120-01-349-1385	55719	XB1618	WRENCH, BOX, 1/2 X 9/16	1
23	PAOZZ	8140-00-828-2938	19203	7553315	CHEST, AMMUN.....	1
24	XDOZZ			EP290	VIAL, POLYPROPYLENE	1

END OF FIGURE

**OPERATOR AND UNIT MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
NATIONAL STOCK NUMBER INDEX**

NSN	FIG.	ITEM	NSN	FIG.	ITEM
	4	2	5310-00-407-9566	7	13
	5	6	5305-00-781-3926	7	11
	1	7	5305-00-781-3927	7	10
	7	15	5305-00-781-3928	7	9
	1	6	8140-00-828-2938	7	23
	1	4	5310-00-931-8167	3	4
	1	5	5975-00-985-6630	7	17
	4	1	5305-00-988-7841	3	2
	3	5	5935-01-181-6651	3	6
	1	2	5310-01-315-3803	7	12
	1	8	5310-01-338-7338	3	3
	5	2	5120-01-349-1385	7	22
	4	3	5305-01-386-9052	7	7
	7	1	5310-01-396-0977	5	1
	6	3	5310-01-396-0977	7	5
	7	4	5120-01-428-7830	7	20
	7	18	1095-01-450-2798	1	1
	7	19	6240-01-450-4886	2	2
	7	24	6240-01-450-4886	7	3
5306-00-050-1238	7	14	6150-01-453-9284	6	6
6210-00-176-4955	2	1	011040--454-1625	3	1
5120-00-187-7124	7	21	2540-01-456-9071	1	3
5999-00-195-9699	6	7	5920-01-470-5001	6	5
5999-00-230-1212	6	1	5920-01-470-5001	7	2
5305-00-269-3240	7	16	5305-01-475-3154	7	8
5975-00-281-0046	6	4	5305-01-964-0503	7	6
5940-00-283-5280	6	2			

END OF WORK PACKAGE

**OPERATOR AND UNIT MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
PART NUMBER INDEX**

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
1120-1105	7	18	B1821BH038C500N	7	6
13-12-1001	3	1	B1821BH038C600N	7	7
13-12-1005	4	2	B1821BH038C700N	7	8
13-12-1014	1	3	B1821BH038F150N	7	16
13-12-1034	6	6	BU-48C	6	1
13-12-1035	1	1	BU-49-0	6	3
13-12-1110	5	6	BU-49-2	6	4
13-12-1114	1	7	BU-60	6	7
13-12-1115	7	15	EP290	7	24
13-12-1116	1	6	LC35GT2	2	1
13-12-1120	1	4	M45913/1-6CG8	7	4
13-12-1121	1	5	M6363/8-5	2	2
13-12-1125	4	1	M6363/8-5	7	3
13-12-1127	3	5	MS16995-67	3	2
13-12-1134	1	2	MS25036-106	6	2
13-12-1135	1	8	MS25043-14D	3	6
196ACP	7	20	MS3367-3	7	17
7553315	7	23	MS35338-45	3	3
95390A318	5	2	MS35338-45	7	13
95390A318	7	19	MS35338-46	7	12
9654K296	4	3	MS51967-6	3	4
9654K296	7	1	NAS1149F0632P	5	1
B107.6	7	21	NAS1149F0632P	7	5
B1821BH031F075N	7	14	SFE-20	6	5
B1821BH038C275N	7	11	SFE-20	7	2
B1821BH038C350N	7	10	XB1618	7	22
B1821BH038C400N	7	9			

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE**M315 GRENADE LAUNCHER INSTALLATION KIT**

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

SCOPE

This appendix lists Components of End Item and Basic Issue Items for the M 315 Installation Kit to help you inventory items required for safe and efficient operation of the equipment.

GENERAL

The Components of End Item (COEI) and Basic Issue Items (BII) are divided into the following sections:

Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the M315 Installation Kit but can be removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

Basic Issue Items. These essential items are required to place the M315 Installation Kit in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the Installation Kits during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the item by TOE/MTOE. Illustrations are furnished to help you find and identify the items.

EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

Column (1), Illus Number, gives you the number of the item illustrated.

Column (2), National Stock Number, identifies the stock number of the item to be used for requisitioning purposes.

Column (3), Description and Usable On Code, identifies the Federal item name (in all capital letters) followed by a minimum description is the CAGEC (Commercial and Government Entity Code) in parentheses and the reference number.

Column (4), U/M (Unit of Measure), indicates how the item is issued for the National Stock Number shown in column (2).

Column (5), Qty Rqd, indicates the quantity required.

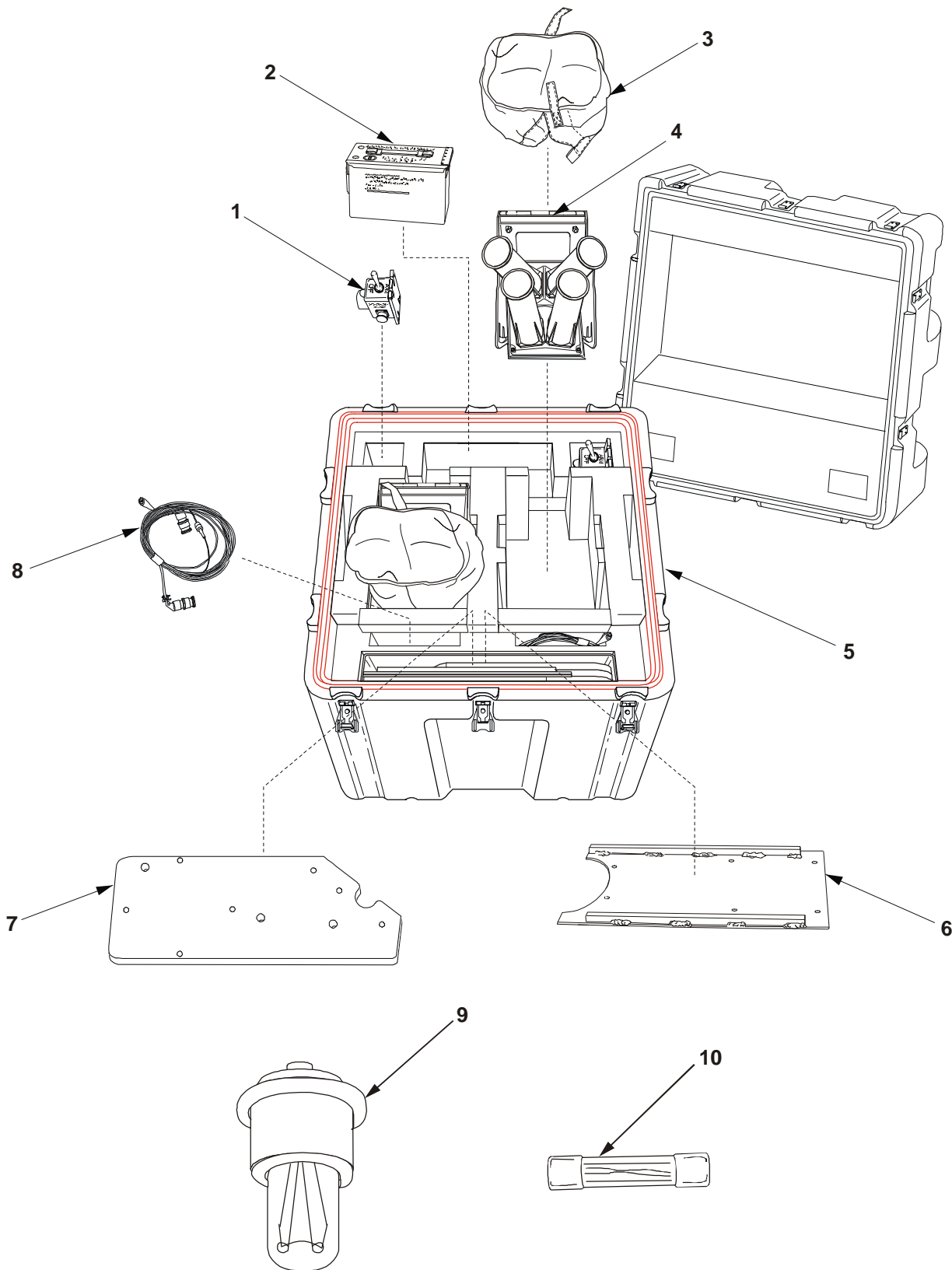


Table 1. Components of End Item List

(1) Illustration Number	(2) National Stock Number	(3) Description, CAGEC, and reference number	Usable on code	(4) U/M	(5) Quantity Required
1	1095-01-450-2798	ARMING FIRING UNIT (81361) 13-12-1035		EA	1
2		ASSEMBLY PARTS PACKAGE (81361) 13-12-1134		EA	1
3	2540-01-456-9071	COVER, CANVAS (81361) 13-12-1014		EA	2
4		DISCHARGER ASSEMBLY (81361) 13-12-1120		EA	2
5		CONTAINER ASSEMBLY (81361) 13-12-1121		EA	1
6		MOUNTING BRACKET (TOW II CONFIGURATION) (81361) 13-12-1116		EA	2
7		MOUNTING BRACKET (MACHINE GUN CONFIGURATION) (81361) 13-12-1114		EA	2
8		WIRING HARNESS BRANCH (81361) 13-12-1135		EA	2
ON BOARD SPARES (LOCATED IN ACCESSORY PARTS PACKAGE)					
9	6240-01-450-4886	LAMP, INCANDESCENT (81349) M363/8-5		EA	2
10	5920-01-970-5001	FUSE, 20 AMP (71400) SFE-20		EA	2

Table 2. Basic Issue Items List

(1) Illustration Number	(2) National Stock Number	(3) Description, CAGEC, and reference number	Usable on code	(4) U/M	(5) Quantity Required
NA	NA	TM 3-1055-649-12&P, Operator's and Unit Maintenance Manual for Installation Kit, Grenade Launcher: Adjustable, Multi- Purpose, 66mm, Turret Mounted, M315		EA	2

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
EXPENDABLE AND DURABLE ITEMS LIST

SCOPE

This appendix lists expendable and durable items that you will need to operate and maintain the M315 Installation Kit. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except medical, Class V repair parts, and heraldic items) or CTA 8-100, Army Medical Department Expendable/ Durable Items.

EXPLANATION OF COLUMNS

Column (1) - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item (e.g., "Use rag, item 4, WP 0034 00).

Column (2) - Level. This column identifies the lowest level of maintenance that requires the listed item.

Column (3) - National Stock Number. This is the National Stock Number assigned to the item which you can use to requisition it.

Column (4) - Description. Indicates the item name, description, (CAGEC) and part number. This provides the other information you need to identify the item.

Column (5) - Unit of Measure (U/M). This code shows the physical measurement or count of an item, such as each (EA), gallon (GL), bale (BE), etc. If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Table 1. Expendable and Durable Items List

(1) ITEM NUMBER	(2) LEVE L	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGE, PART NUMBER	(5) U/M
1	C	9920-01-192-7611	CLEANER, TOBACCO, PIPE (63926) 130-001	EA
2	C	8030-01-418-9008	CORROSION PREVENTION COMPOUND (39428) 1347K11	EA
3	C	7930-00-282-9699	DETERGENT, GENERAL PURPOSE (83421) 7930-00-282-9699	GL
4	C,O	7920-00-148-9666	RAG, WIPING (58536) A-A-2522	BE

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE
M315 GRENADE LAUNCHER INSTALLATION KIT
MANDATORY REPLACEMENT PARTS LIST

MANDATORY REPLACEMENT PARTS LIST

This work package includes a list of all mandatory replacement parts referenced in the task initial setups and procedures. These are items that must be replaced during maintenance whether they have failed or not. This includes items based on usage intervals such as miles, time, rounds fired, etc.

Table 1. Mandatory Replacement Parts List

ITEM NUMBER	PART NUMBER/ CAGEC	NATIONAL STOCK NUMBER	NOMENCLATURE	QTY
1	MS35338-46 96906	5310-01-315-3803	WASHER, LOCK 3/8	3
2	MS35338-45 96906	5310-00-407-9566	WASHER, LOCK 5/16	4

END OF WORK PACKAGE

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE (Insert Date)
TO: (Forward to proponent of publication or form) (Include ZIP Code) Commander, U.S. Soldier and Biological Chemical Command ATTN: AMSSB-REN-CW, Publications Control Officer Aberdeen Proving Ground, MD 21010-5424						FROM: (Activity and location) (Include ZIP Code) (Insert your address)	
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER TM 3-1055-649-12&P				DATE 31 August 2001	TITLE Operator's and Unit Maintenance Manual for M315 Installation Kit		
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).	
1	0011 00-2					In step 2a, change "WP 0032 00" to " WP 0034 00". REASON: WP 0032 00 is the wrong WP to reference. It should have been WP 0034 00.	
2	0018 00-3					In step 2, change "receptical" to "recepticle". REASON: To correct the spelling error.	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE SFC John Green				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION DSN 555-5555		SIGNATURE	

TO: (Forward direct to addressee listed in publication)					FROM: (Activity and location) (Include ZIP Code)			DATE	
PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS									
PUBLICATION NUMBER					DATE			TITLE	
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION	
<div style="font-size: 100px; opacity: 0.1; transform: rotate(-30deg); pointer-events: none;">SAMPLE</div>									
PART III – REMARKS (Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)									
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION			SIGNATURE		

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By Order of the Secretary of the Army:

Official:



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*Administrative Assistant to the
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ERIC K. SHINSEKI
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Chief of Staff*

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